



2005 STANDARD DRAWINGS

<http://www.udot.utah.gov/index.php/m=c/tid=1091>

Change 8, December 18, 2006

Memorandum UTAH DEPARTMENT OF TRANSPORTATION

DATE: December 18, 2006

TO: Region Directors
Project Engineers
Project Design Engineers
Project Managers
Consultants and Contractors

FROM: Barry Axelrod, CDT
Standards and Specifications

SUBJECT: 2005 Standard Drawings [U.S. Standard Unit (Inch-Pound Units)] Change 8,
Dated December 18, 2006

A new index and updated drawings are attached. Please take the following action with respect to the attached pages.

REMOVE

Cover
N/A
Index
Listing

Sheet 1B

BA 3A

None

None

BA 3B

None

BA 4B

BA 4D

BA 4E

BA 4L

BA 4P

None

None

CC 8A

CC 8B

CC 9A

INSERT

Cover - revised for Change Eight

Memo - Insert after cover

Index - revised

Listing of Revised Standard Drawings, w/Changes 1, 2, 3, 4, 5, 6,
7, & 8

Sheet 1B - revised

None - deleted (replaced by BA 3A1 and BA 3A2)

BA 3A1 - new

BA 3A2 - new

BA 3B - revised

BA 3C - new

BA 4B - revised

BA 4D - revised

BA 4E - revised

BA 4L - revised

BA 4P - revised

BA 4S1 - new

BA 4S2 - new

CC 8A - revised

CC 8B - revised

CC 9A - revised

Electronic files for all Standards Drawings are available on the Internet from the "2005 Standards" Web page, under "2005 Standard Drawings." Individual files are available in two locations. For Microstation DGN format files download individual files from the "2005

Individual Standard Drawings (DGN)” link. For Adobe PDF format files download individual and series files from the “2005 Individual Standard Drawings (PDF)” link. The Series files are zipped in an EXE file. The entire set of drawings is available in Adobe pdf format in six files from the same area as the “2005 Current Drawings” link. The following page shows a break down of the six parts and the drawing series included in each part.

Any changes made to a digitally signed UDOT Standard Drawing Microstation DGN files automatically invalids the digital signatures.

Please note that the 2005 Standards are still in effect. There is no plan to issue a new set of Standards for a 2006 version.

If you have any questions or problems with the electronic files contact me at 801-964-4570 or by email at baxelrod@utah.gov.

Because of file size the 2005 Standard Drawings have been split into six files. The contents of each part are listed below.

Part 1 (Updated as part of Change 1, 2, 3, 4, 5, 6, 7, and 8)

Index

Sheets 1B and 1C

AT Series Drawings

BA Series Drawings

Part 2 (Updated as part of Change 1, 2, 3, 4, 5, and 8)

CB Series Drawings

CC Series Drawings

DB Series Drawings

Part 3 (Updated as part of Change 1, 2, 4 and 6)

DD Series Drawings

DG Series Drawings

EN Series Drawings

Part 4 (Updated as part of Change 1, 2, 3, 6, and 7)

FG Series Drawings

GF Series Drawings

GW Series Drawings

Part 5 (Updated as part of Change 2, 4, and 6)

PV Series Drawings

SL Series Drawings

SN Series Drawings

Part 6 (Updated as part of Change 1, 6, and 7)

ST Series Drawings

SW Series Drawings

TC Series Drawings

STANDARD DRAWINGS INDEX (Change 8, Dated 12/18/06)
UTAH DEPARTMENT OF TRANSPORTATION

X	NUMBER	TITLE	CURRENT DATE
		Advanced Traffic Management System (AT)	
___	AT 1	Legend Sheet	02/24/05
___	AT 2	Ramp Meter Details	02/24/05
___	AT 3	Ramp Meter Sign Panel	02/24/05
___	AT 4	Typical Ramp Meter Signal Head Mounting	04/28/05
___	AT 5	Ramp Meter Loop Installation	02/24/05
___	AT 6	Conduit Details	02/24/05
___	AT 7	Polymer-Concrete Junction Box Details	02/23/06
___	AT 8	ATMS Cabinet	02/24/05
___	AT 9	ATMS Cabinet Disconnect And Transformer Frame	02/24/05
___	AT 10	CCTV Mounting Details	02/24/05
___	AT 11	CCTV Pole Details	02/23/06
___	AT 12	CCTV Pole Foundation For Dedicated CCTV Pole	02/24/05
___	AT 13	Not Used	
___	AT 14	Weigh In Motion Piezo Details	02/24/05
___	AT 15	RWIS Site And Foundation Details	02/24/05
___	AT 16	RWIS Tower Base And Service Pad Layout	02/24/05
___	AT 17	Ground Rod Installation And Tower Grounding	02/24/05
___	AT 18	TMS Detection Zone Layout	02/24/05
		Barriers (BA)	
___	BA 1A	Precast Concrete Full Barrier Standard Section	02/23/06
___	BA 1B	Precast Concrete Full Barrier Standard Section	08/25/05
___	BA 1C	Precast Concrete Barrier Terminal For Speed \leq 40 MPH	01/01/05
___	BA 1D	Precast Concrete Full Section Median Installation	01/01/05
___	BA 1E	Precast Concrete Full Section Shoulder Applications	01/01/05
___	BA 2	Precast Concrete Half Barrier Standard Section	01/01/05
___	BA 3A1	Cast In Place Constant Slope Barrier	11/30/06
___	BA 3A2	Cast In Place Constant Slope Barrier	11/30/06
___	BA 3B	Precast Concrete Constant Slope Transition Section For Crash Cushion And W-Beam Guardrail	11/30/06
___	BA 3C	Precast Constant Slope Concrete Barrier (Type X Joint Connection)	11/30/06
___	BA 4A	W-Beam Guardrail Hardware	01/01/05
___	BA 4B	W-Beam Guardrail Transition	11/30/06
___	BA 4C	W-Beam Guardrail Transition Curb Section	02/24/05
___	BA 4D	W-Beam Guardrail Anchor Type I	11/30/06
___	BA 4E	W-Beam Guardrail Installations	11/30/06
___	BA 4F	W-Beam Guardrail Typical Divided Roadways	01/01/05
___	BA 4G	W-Beam Guardrail Typical Multilane Arterial	01/01/05
___	BA 4H	W-Beam Guardrail Typical 2 Lane 2 Way	01/01/05
___	BA 4I	W-Beam Guardrail Buried In Backslope Terminal	01/01/05
___	BA 4J	W-Beam Guardrail Buried In Backslope Terminal With Rub Rail	01/01/05

___	BA 4K	W-Beam Guardrail Buried In Backslope Terminal Anchor	01/01/05
___	BA 4L	W-Beam Guardrail Curve Details	11/30/06
___	BA 4M	W-Beam Guardrail Nested Guardrail 12' 6" Span	01/01/05
___	BA 4N	W-Beam Guardrail Nested Guardrail 18' 9" Span	01/01/05
___	BA 4O	W-Beam Guardrail Nested Guardrail 25' Span	01/01/05
___	BA 4P	W-Beam Guardrail With Precast Barrier For Span > 25'	11/30/06
___	BA 4Q	Not Use	
___	BA 4R	W-Beam Median Barrier Transition	10/27/05
___	BA 4S1	W-Beam Guardrail With Modified Curb and Curb and Gutter	11/30/06
___	BA 4S2	W-Beam Guardrail With Curb and Gutter $\geq 5'$	11/30/06

Catch Basins And Cleanouts (CB)

___	CB 1	Curb and Gutter Inlet	04/28/05
___	CB 2	Open Curb Inlet	04/28/05
___	CB 3	Shallow Catch Basin	04/28/05
___	CB 4	Open Curb Shallow Catch Basin	01/01/05
___	CB 5A	Standard Catch Basin and Cleanout Box	06/30/05
___	CB 5B	Standard Catch Basin and Cleanout Box Section	01/01/05
___	CB 6A	Drop Inlet Type "A"	01/01/05
___	CB 6B	Berm Apron With Drop Inlet Type "A"	01/01/05
___	CB 7A	Drop Inlet Type "B"	01/01/05
___	CB 7B	Normal Apron With Drop Inlet Type "B"	01/01/05
___	CB 8A	Double Catch Basin	01/01/05
___	CB 8B	Double Catch Basin	01/01/05
___	CB 9A	Standard Catch Basin And Cleanout Box Situation And Layout	01/01/05
___	CB 9B	Standard Catch Basin And Cleanout Box Section Details	01/01/05
___	CB 9C	Standard Catch Basin And Cleanout Box Schedule Of Installation 18" to 42" RCP 12" to 48" CMP	01/01/05
___	CB 9D	Standard Catch Basin And Cleanout Box Schedule Of Installation 48" to 66" RCP 60" to 78" CMP	01/01/05
___	CB 10A	Standard Catch Basin And Cleanout Box Situation And Layout	01/01/05
___	CB 10B	Standard Catch Basin And Cleanout Box Section Details	01/01/05
___	CB 10C	Standard Catch Basin And Cleanout Box Schedule Of Installation 42" to 60" RCP 48" to 72" CMP	01/01/05
___	CB 11	Standard Manhole	01/01/05

Crash Cushions (CC)

___	CC 1	Crash Cushion Markings	01/01/05
___	CC 2	Crash Cushion Drainage Details Guideline A	01/01/05
___	CC 3	Crash Cushion Drainage Details Guideline B	01/01/05
___	CC 4	Details For Placement Crash Cushions Type A, B, And D	01/01/05
___	CC 5A	Grading And Placement Details Crash Cushion Type C "Brakemaster"	10/27/05
___	CC 5B	Grading And Placement Details Crash Cushion Type C "C.A.T"	10/27/05
___	CC 5C	Grading And Placement Details Crash Cushion Type C "FLEAT-MT"	10/27/05
___	CC 6	Crash Cushion Type E Sand Barrel Details	01/01/05

___	CC 7A	Grading And Installation Details Crash Cushion Type F Quad Trend 350	02/24/05
___	CC 7B	Crash Cushion Type F BEAT-SSCC	08/25/05
___	CC 8A	Grading And Installation Details Crash Cushion Type G	11/30/06
___	CC 8B	Grading And Installation Details For "3R" Projects Crash Cushion Type G	11/30/06
___	CC 9A	Grading And Installation Details Crash Cushion Type H	11/30/06
___	CC 9B	Grading And Installation Details Crash Cushion Type H (Parabolic Flare)	04/28/05

Diversion Boxes (DB)

___	DB 1A	Standard Diversion Box/Cover Plate/Grating For 18" DIA. or 24" DIA. Pipe	01/01/05
___	DB 1B	Standard Diversion Box Hinged Lid Details For 18" DIA. or 24" DIA. Pipe	01/01/05
___	DB 1C	Standard Diversion Box Bicycle - Safe Grating Details For 18" DIA. or 24" DIA. Pipe	01/01/05
___	DB 1D	Standard Diversion Box Three Gate Box Sections For 18" DIA. or 24" DIA. Pipe	01/01/05
___	DB 1E	Standard Diversion Box Three Gate Box Sections For 18" DIA. or 24" DIA. Pipe	01/01/05
___	DB 1F	Standard Diversion Box Three Gate Box Sections For 18" DIA. or 24" DIA. Pipe	01/01/05
___	DB 2A	Standard Diversion Box w/Interchangeable Walls, Bottom Slab, Walls And Apron Details	01/01/05
___	DB 2B	Standard Diversion Box w/Interchangeable Walls, Quantities Schedule	01/01/05
___	DB 2C	Standard Diversion Box w/Interchangeable Walls, Hand Slide Gate Details	01/01/05
___	DB 2D	Standard Diversion Box Type "G" Hand Slide Gate Details	01/01/05
___	DB 2E	Standard Diversion Box Hinged Lid (Solid Cover Plate) Type "A" Details Type I Plan	01/01/05
___	DB 2F	Standard Diversion Box Hinged Lid (Solid Cover Plate) Type "A" Details Type II Plan	01/01/05
___	DB 2G	Standard Diversion Box Hinged Lid Solid Cover Type "B" Details	01/01/05
___	DB 2H	Standard Diversion Box Hinged Lid Solid Cover Type "B" And "C" Details	01/01/05
___	DB 3A	Standard Diversion Box With Manhole Cover Situation And Layout	01/01/05
___	DB 3B	Standard Diversion Box With Manhole Cover Up To 42" RCP And Up To 54" CMP	01/01/05
___	DB 3C	Standard Diversion Box With Manhole Cover 48" to 72" RCP And 60" to 84" CMP	01/01/05
___	DB 4	Standard Transition Concrete Lined Ditch To Pipe Or Diversion Box	01/01/05

Design Drawings (DD)

___	DD 1	Superelevation And Widening	01/01/05
___	DD 2	Surface Ditch, Benched Slope, And Cut Ditch Details	01/01/05
___	DD 3	Climbing Lanes	01/01/05
___	DD 4	Geometric Design for Freeways (Roadway)	04/28/05
___	DD 5	Entrance And Exit Ramps At Crossroads	01/01/05
___	DD 6	Entrance And Exit Ramp Geometrics	01/01/05
___	DD 7	Freeway Crossover	01/01/05
___	DD 8	Structural Geometric Design Standards For Clearances	01/01/05
___	DD 9	Structural Geometric Design Standards	01/01/05
___	DD 10	Railroad Clearances At Highway Overpass Structures	01/01/05
___	DD 11	Rural Multi Lane Highways Other Than Freeways	01/01/05
___	DD 12	Rural Two Lane Highways	01/01/05
___	DD 13	Frontage And Access Roads (Under 50 ADT)	01/01/05
___	DD 14	Typical Rural 2 Lane Road With Median Lane And Deceleration Lane For Intersecting Crossroads	01/01/05

Drainage (DG)

___	DG 1	Fill Height for Metal Pipe (Steel)	08/25/05
___	DG 2	Fill Height for Metal Pipe (Aluminum)	01/01/05
___	DG 3	Maximum Fill Height For HDPE And PVC Pipes	01/01/05
___	DG 4	Pipe Minimum Cover	01/01/05
___	DG 5A	Plastic Pipe Culvert Installation	02/23/06
___	DG 5B	Metal Pipe Or Pipe Arch Culvert Installation	02/23/06
___	DG 5C	Precast Concrete Pipe Culvert Installation	02/23/06
___	DG 6	Safety Slope End Section For Circular and Arched Pipes	02/23/06
___	DG 7	Gasketed Joints Or Coupling Bands For CMP	01/01/05
___	DG 8	Metal Culvert End Section	01/01/05
___	DG 9	Miscellaneous Pipe Details	02/23/06

Environmental Controls (EN)

___	EN 1	Temporary Erosion Control (Check Dams)	08/25/05
___	EN 2	Temporary Erosion Control (Silt Fence)	08/25/05
___	EN 3	Temporary Erosion Control (Slope Drain And Temporary Berm)	08/25/05
___	EN 4	Temporary Erosion Control (Drop Inlet Barriers)	08/25/05
___	EN 5	Temporary Erosion Control (Pipe Inlet And Curb Inlet Barriers)	08/25/05
___	EN 6	Temporary Erosion Control (Sediment Trap and Stabilized Construction Entrance)	08/25/05
___	EN 7	Temporary Erosion Control (Straw Bale Barrier)	08/25/05

Fence And Gates (FG)

___	FG 1A	Right Of Way Fence And Gates (Wood Post)	01/01/05
___	FG 1B	Right Of Way Fence And Gates (Wood Post)	01/01/05
___	FG 2A	Right Of Way Fence And Gates (Metal Post)	01/01/05
___	FG 2B	Right Of Way Fence And Gates (Metal Post)	01/01/05
___	FG 3	Swing Gates Type I For Gates Less Than 17'	02/24/05

—	FG 4A	Deer Crossing Details	04/28/05
—	FG 4B	Deer Ramp Details	04/28/05
—	FG 5	Swing Gates Type II For Gates Wider Than 17'	01/01/05
—	FG 6	Chain Link Fence	01/01/05

Grates, Frames, And Trash Racks (GF)

—	GF 1	Manhole Frame And Grated Cover	01/01/05
—	GF 2	Manhole Frame And Solid Cover	01/01/05
—	GF 3	Rectangular Grate And Frame	01/01/05
—	GF 4	Directional Flow Grate And Frame	01/01/05
—	GF 5	Solid Cover And Frame	01/01/05
—	GF 6	Manhole Steps	01/01/05
—	GF 7	Standard Screw Gate And Frame	01/01/05
—	GF 8	2' x 2' Grate And Frame	01/01/05
—	GF 9	28" x 24" Directional Flow Grate And Frame	01/01/05
—	GF 10	Standard Trash Racks 90 ° X-ing Angle	01/01/05
—	GF 11	Standard Trash Racks	01/01/05
—	GF 12	Standard Trash Racks	01/01/05
—	GF 13	Open Curb Inlet Grate and Frame	01/01/05
—	GF 14	Solid Cover For Std Dwg DB 1 MS-18 Loading	01/01/05
—	GF 15	Standard Screw Gate And Frame	01/01/05

General Road Work (GW)

—	GW 1	Raised Median And Plowable End Section	01/01/05
—	GW 2	Concrete Curb And Gutter	01/01/05
—	GW 3	Concrete Curb And Gutter Details	01/01/05
—	GW 4	Concrete Driveways And Sidewalks	01/01/05
—	GW 5A	Pedestrian Access	02/23/06
—	GW 5B	Pedestrian Access	02/23/06
—	GW 5C	Pedestrian Access	06/30/05
—	GW 6	Right Of Way Marker	06/29/06
—	GW 7	Newspaper And Mailbox Stop Layout	01/01/05
—	GW 8	Newspaper And Mailbox Support Hardware	01/01/05
—	GW 9	Delineation Hardware	01/01/05
—	GW 10	Delineation Application	01/01/05
—	GW 11	Sidewalks And Shoulders On Urban Roadways	01/01/05

Paving (PV)

—	PV 1	Joints For Highways With Concrete Traffic Lanes And Shoulders	01/01/05
—	PV 2	Pavement/Approach Slab Details	01/01/05
—	PV 3	Concrete Pavement Details For Urban And Interstate	01/01/05
—	PV 4	Concrete Pavement Details For Urban And Interstate	01/01/05
—	PV 5	Urban Concrete Pavement Details	01/01/05
—	PV 6	Rumble Strips	01/01/05
—	PV 7	Rumble Strips - Typical Application	01/01/05
—	PV 8	Note Used	

___	PV 9	Dowel Bar Retrofit	01/01/05
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Signals (SL)

___	SL 1A	Traffic Signal Mast Arm Pole And Luminaire Extension	02/23/06
___	SL 1B	Traffic Signal Mast Arm Pole And Luminaire Extension	02/23/06
___	SL 2	Traffic Signal Mast Arm Details 30' Thru 75'	02/23/06
___	SL 3	Underground Service Pedestal Details	02/23/06
___	SL 4	Traffic Signal Mast Arm Pole Foundation	02/23/06
___	SL 5	Traffic Signal Pole	02/23/06
___	SL 6	Pole Mounted Power Source Details	01/01/05
___	SL 7	Span Wire Signal Pole Details	01/01/05
___	SL 8	Signal Head Details	02/23/06
___	SL 9	Pedestrian Signal Assembly	01/01/05
___	SL 10	Traffic Signal Controller Base Details	02/23/06
___	SL 11	Traffic Signal Loop Detector Details	02/23/06
___	SL 12	Traffic Counting Loop Detector Details	04/28/05
___	SL 13	Video Detection Camera Mount	02/23/06
___	SL 14	Highway Luminaire Pole Ground Mount	08/25/05
___	SL 15	Luminaire Slip Base Details	08/25/05
___	SL 16	Highway Luminaire Pole Barrier Mount	01/01/05
___	SL 17	Highway Luminaire Pole Foundation Extension	01/01/05
___	SL 18	Single Transformer Substation Details	01/01/05

Signs (SN)

___	SN 1	Bridge Load Limits Signs	01/01/05
___	SN 2	School Speed Limit Assembly	01/01/05
___	SN 3	Overhead School Speed Limit Assembly	01/01/05
___	SN 4	Flashing Stop Sign	01/01/05
___	SN 5	Typical Installation For Milepost Signs	01/01/05
___	SN 6	Speed Reduction Sign Sequence	01/01/05
___	SN 7	Placement of Ground Mounted Signs	01/01/05
___	SN 8	Ground Mounted Timber Sign Post (P1)	04/28/05
___	SN 9	Ground Mounted Tubular Steel Sign Post (P2)	01/01/05
___	SN 10	Ground Mounted Square Steel Sign Post (P3)	01/01/05
___	SN 11	Slipbase Ground Mounted Tubular Steel Sign Post (P4)	04/28/05
___	SN 12A	Ground Mounted Sign Installation Details	08/25/05
___	SN 12B	Ground Mounted Sign Installation Details	01/01/05
___	SN 12C	Ground Mounted Sign Installation Details	01/01/05

Striping (ST)

___	ST 1	Object Markers "T" Intersection And Pavement Transition Guidance	01/01/05
___	ST 2	Freeway Crossover Markings	01/01/05
___	ST 3	Typical Pavement Markings	01/01/05
___	ST 4	Crosswalks, Parking And Intersection Approaches	06/29/06
___	ST 5	Painted Median And Auxiliary Lane Details	02/23/06
___	ST 6	Passing/Climbing Lanes Traffic Control	01/01/05

___	ST 7	Pavement Markings And Signs At Railroad Crossing	01/01/05
___	ST 8	Plowable Pavement Markers	01/01/05
___	ST 9	School Crossing And School Message	01/01/05

Structures And Walls (SW)

___	SW 1A	Welded End Guard Unit	01/01/05
___	SW 1B	Precast Concrete Cattle Guard	01/01/05
___	SW 2	Noise Wall Placement Area	01/01/05
___	SW 3A	Precast Concrete Noise Wall 1 Of 2	01/01/05
___	SW 3B	Precast Concrete Noise Wall 2 Of 2	01/01/05
___	SW 4A	Precast Concrete Retaining/Noise Wall 1 Of 2	01/01/05
___	SW 4B	Precast Concrete Retaining/Noise Wall 2 Of 2	02/23/06

Traffic Control (TC)

___	TC 1A	Construction Zone Channelization Devices	01/01/05
___	TC 1B	Construction Zone Signing	01/01/05
___	TC 2A	Traffic Control General	01/01/05
___	TC 2B	Traffic Control General	01/01/05
___	TC 3	Traffic Control Project Limit Signing	01/01/05
___	TC 4	Traffic Control Urban Intersections With Roadways Under 50 MPH	01/01/05
___	TC 5	Traffic Control Urban Intersections With Roadways Under 50 MPH	01/01/05
___	TC 6	Traffic Control Pedestrian Routing	01/01/05
___	TC 7	Traffic Control Road Closed, Detour	01/01/05
___	TC 8	Traffic Control Lane Closure	01/01/05
___	TC 9	Traffic Control Multilane Closure	01/01/05
___	TC 10	Traffic Control Expressway And Freeway Crossover/Turn Around	01/01/05
___	TC 11	Traffic Control Exit Ramp Gore	06/29/06
___	TC 12	Traffic Control Entrance Ramp Gore	01/01/05
___	TC 13	Traffic Control Shoulder-Haul Road	01/01/05
___	TC 14	Traffic Control Flagging Operation	01/01/05
___	TC 15	Traffic Control 2 Lane/2 Way Seal Coat With Cover Material	01/01/05
___	TC 16	Traffic Control Pavement Marking	01/01/05

Listing of Revised Standard Drawings

Change One

Revised February 24, 2005

AT 1	Legend Sheet	02/24/2005
AT 2	Ramp Meter Details	02/24/2005
AT 3	Ramp Meter Sign Panel	02/24/2005
AT 5	Ramp Meter Loop Installation	02/24/2005
AT 6	Conduit Details	02/24/2005
AT 7	Polymer-Concrete Junction Box Details	02/24/2005
AT 8	ATMS Cabinet	02/24/2005
AT 9	ATMS Cabinet Disconnect And Transformer Frame	02/24/2005
AT 10	CCTV Mounting Details	02/24/2005
AT 11	CCTV Pole Details	02/24/2005
AT 12	CCTV Pole Foundation For Dedicated CCTV Pole	02/24/2005
AT 13	Deleted	N/A
AT 14	Weigh In Motion Piezo Details	02/24/2005
AT 15	RWIS Site And Foundation Details	02/24/2005
AT 16	RWIS Tower Base And Service Pad Layout	02/24/2005
AT 17	Ground Rod Installation And Tower Grounding	02/24/2005
AT 18	TMS Detection Zone Layout	02/24/2005
BA 3	Deleted	N/A
BA 3A	Cast In Place Constant Slope Barrier	02/24/2005
BA 3B	Precast Concrete Constant Slope Transition Section For Crash Cushion And W-Beam Guardrail	02/24/2005
BA 4B	W-Beam Guardrail Transition	02/24/2005
BA 4C	W-Beam Guardrail Transition Curb Section	02/24/2005
CC 7	Deleted	N/A
CC 7A	Grading And Installation Details Crash Cushion Type F Quad Trend 350	02/24/2005
CC 7B	Reserved For Future Use	N/A
CC 8	Deleted	N/A
CC 8A	Grading And Installation Details Crash Cushion Type G	02/24/2005
CC 8B	Grading And Installation Details For "3R" Projects Crash Cushion Type G	02/24/2005
CC 9A	Grading And Installation Details Crash Cushion Type H	02/24/2005
CC 9B	Grading And Installation Details Crash Cushion Type H (Parabolic Flare)	02/24/2005
DD 4	Geometric Design for Freeways (Roadway)	02/24/2005
FG 3	Swing Gates Type I For Gates Less Than 17'	02/24/2005
ST 5	Painted Median And Auxiliary Lane Details	02/24/2005

Change Two

Revised April 28, 2005

AT 4	Typical Ramp Meter Signal Head Mounting	04/28/2005
CB 1	Curb and Gutter Inlet	04/28/2005
CB 2	Open Curb Inlet	04/28/2005
CB 3	Shallow Catch Basin	04/28/2005
CC 8A	Grading And Installation Details Crash Cushion Type G	04/28/2005
CC 8B	Grading And Installation Details For "3R" Projects Crash Cushion Type G	04/28/2005
CC 9A	Grading And Installation Details Crash Cushion Type H	04/28/2005
CC 9B	Grading And Installation Details Crash Cushion Type H (Parabolic Flare)	04/28/2005
DD 4	Geometric Design for Freeways (Roadway)	04/28/2005
FG 4	Deleted	N/A
FG 4A	Deer Crossing Details	04/28/2005
FG 4B	Deer Ramp Details	04/28/2005
SL 12	Traffic Counting Loop Detector Details	04/28/2005
SL 13	Video Detection Camera Mount	04/28/2005
SN 8	Ground Mounted Timber Sign Post (P1)	04/28/2005
SN 11	Slipbase Ground Mounted Tubular Steel Sign Post (P4)	04/28/2005

Change Three

Revised June 30, 2005

CB 5A	Standard Catch Basin and Cleanout Box	06/30/2005
GW 5A	Pedestrian Access	06/30/2005
GW 5B	Pedestrian Access	06/30/2005
GW 5C	Pedestrian Access	06/30/2005

Change Four

Revised August 25, 2005

BA 1B	Precast Concrete Full Barrier Standard Section	08/25/2005
BA 3B	Precast Concrete Constant Slope Transition Section	08/25/2005
	For Crash Cushion And W-Beam Guardrail	08/25/2005
BA 4B	W-Beam Guardrail Transition	08/25/2005
CC 7B	Crash Cushion Type F BEAT-SSCC	08/25/2005
DG 1	Fill Height for Metal Pipe (Steel)	08/25/2005
EN 1	Temporary Erosion Control (Check Dams)	08/25/2005
EN 2	Temporary Erosion Control (Silt Fence)	08/25/2005
EN 3	Temporary Erosion Control (Slope Drain And Temporary Berm)	08/25/2005
EN 4	Temporary Erosion Control (Drop Inlet Barriers)	08/25/2005
EN 5	Temporary Erosion Control (Pipe Inlet And Curb Inlet Barriers)	08/25/2005
EN 6	Temporary Erosion Control (Sediment Trap and Stabilized Construction Entrance)	08/25/2005
EN 7	Temporary Erosion Control (Straw Bale Barrier)	08/25/2005
SL 14	Highway Luminaire Pole Ground Mount	08/25/2005
SL 15	Luminaire Slip Base Details	08/25/2005
SN 12A	Ground Mounted Sign Installation Details	08/25/2005

Change Five

Revised October 27, 2005

BA 4D	W-Beam Guardrail Anchor Type I	10/27/2005
BA 4R	W-Beam Median Barrier Transition	10/27/2005
CC 5	Deleted	N/A
CC 5A	Grading And Placement Details Crash Cushion Type C "Brakemaster"	10/27/2005
CC 5B	Grading And Placement Details Crash Cushion Type C "C.A.T"	10/27/2005
CC 5C	Grading And Placement Details Crash Cushion Type C "FLEAT-MT"	10/27/2005

Change Six

Revised February 23, 2006

AT 7	Polymer-Concrete Junction Box Details	02/23/2006
AT 11	CCTV Pole Details	02/23/2006
BA 1A	Precast Concrete Full Barrier Standard Section	02/23/2006
DG 5	Deleted	N/A
DG 5A	Plastic Pipe Culvert Installation	02/23/2006
DG 5B	Metal Pipe Or Pipe Arch Culvert Installation	02/23/2006
DG 5C	Precast Concrete Pipe Culvert Installation	02/23/2006
DG 6	Safety Slope End Section For Circular and Arched Pipes	02/23/2006
DG 9	Miscellaneous Pipe Details	02/23/2006
GW 5A	Pedestrian Access	02/23/2006
GW 5B	Pedestrian Access	02/23/2006
SL 1A	Traffic Signal Mast Arm Pole And Luminaire Extension	02/23/2006
SL 1B	Traffic Signal Mast Arm Pole And Luminaire Extension	02/23/2006
SL 2	Traffic Signal Mast Arm Details 30' Thru 75'	02/23/2006
SL 3	Underground Service Pedestal Details	02/23/2006
SL 4	Traffic Signal Mast Arm Pole Foundation	02/23/2006
SL 5	Traffic Signal Pole	02/23/2006
SL 8	Signal Head Details	02/23/2006
SL 10	Traffic Signal Controller Base Details	02/23/2006
SL 11	Traffic Signal Loop Detector Details	02/23/2006
SL 13	Video Detection Camera Mount	02/23/2006
ST 5	Painted Median And Auxiliary Lane Details	02/23/2006
SW 4B	Precast Concrete Retaining/Noise Wall 2 Of 2	02/23/2006

Change Seven

Revised June 29, 2006

GW 6	Right of Way Marker	06/29/2006
ST 4	Crosswalks, Parking and Intersection Approaches	06/29/2006
TC 11	Traffic Control Exit Ramp Gore	06/29/2006

Change Eight

Revised November 30, 2006

BA 3A	Deleted	N/A
BA 3A1	Cast In Place Constant Slope Barrier	11/30/06
BA 3A2	Cast In Place Constant Slope Barrier	11/30/06
BA 3B	Precast Concrete Constant Slope Transition Section For Crash Cushion And W-Beam Guardrail	11/30/06
BA 3C	Precast Constant Slope Concrete Barrier (Type X Joint Connection)	11/30/06
BA 4B	W-Beam Guardrail Transition	11/30/06
BA 4D	W-Beam Guardrail Anchor Type I	11/30/06
BA 4E	W-Beam Guardrail Installations	11/30/06
BA 4L	W-Beam Guardrail Curve Details	11/30/06
BA 4P	W-Beam Guardrail With Precast Barrier For Span > 25'	11/30/06
BA 4S1	W-Beam Guardrail With Modified Curb and Curb and Gutter	11/30/06
BA 4S2	W-Beam Guardrail With Curb and Gutter $\geq 5''$	11/30/06
CC 8A	Grading And Installation Details Crash Cushion Type G	11/30/06
CC 8B	Grading And Installation Details For "3R" Projects Crash Cushion Type G	11/30/06
CC 9A	Grading And Installation Details Crash Cushion Type H	11/30/06

18-DEC-2006 D:\UT\Standard Drawings\Imperv\2005\Approved\Change8\Approved\sheetlb.dgn

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

DWG. NO.	DESCRIPTION	DATE
	Advanced Traffic Management System (AT)	
AT 1	LEGEND SHEET	02-24-05
AT 2	RAMP METER DETAILS	02-24-05
AT 3	RAMP METER SIGN PANEL	02-24-05
AT 4	TYPICAL RAMP METER SIGNAL HEAD MOUNTING	04-28-05
AT 5	RAMP METER LOOP INSTALLATION	02-24-05
AT 6	CONDUIT DETAILS	02-24-05
AT 7	POLYMER-CONCRETE JUNCTION BOX DETAILS	02-23-06
AT 8	ATMS CABINET	02-24-05
AT 9	ATMS CABINET DISCONNECT AND TRANSFORMER FRAME	02-24-05
AT 10	CCTV MOUNTING DETAILS	02-24-05
AT 11	CCTV POLE DETAILS	02-23-06
AT 12	CCTV POLE FOUNDATION FOR DEDICATED CCTV POLE	02-24-05
AT 13	NOT USED	
AT 14	WEIGHT IN MOTION PIEZO DETAILS	02-24-05
AT 15	RWIS SITE AND FOUNDATION DETAILS	02-24-05
AT 16	RWIS TOWER BASE AND SERVICE PAD LAYOUT	02-24-05
AT 17	GROUND ROD INSTALLATION AND TOWER GROUNDING	02-24-05
AT 18	TMS DETECTION ZONE LAYOUT	02-24-05
	Barriers (BA)	
BA 1A	PRECAST CONCRETE FULL BARRIER STANDARD SECTION	02-23-06
BA 1B	PRECAST CONCRETE FULL BARRIER STANDARD SECTION	08-25-05
BA 1C	PRECAST CONCRETE BARRIER TERMINAL FOR SPEED ≤40 MPH	01-01-05
BA 1D	PRECAST CONCRETE FULL SECTION MEDIAN INSTALLATION	01-01-05
BA 1E	PRECAST CONCRETE FULL SECTION SHOULDER APPLICATIONS	01-01-05
BA 2	PRECAST CONCRETE HALF BARRIER STANDARD SECTION	01-01-05
BA 3A1	CAST IN PLACE CONSTANT SLOPE BARRIER	11-30-06
BA 3A2	CAST IN PLACE CONSTANT SLOPE BARRIER	11-30-06
BA 3B	PRECAST CONCRETE CONSTANT SLOPE TRANSITION SECTION FOR CRASH CUSHION AND W-BEAM GUARDRAIL	11-30-06
BA 3C	PRECAST CONSTANT SLOPE CONCRETE BARRIER (TYPE X JOINT CONNECTION)	11-30-06
BA 4A	W-BEAM GUARDRAIL HARDWARE	01-01-05
BA 4B	W-BEAM GUARDRAIL TRANSITION	11-30-06
BA 4C	W-BEAM GUARDRAIL TRANSITION CURB SECTIONS	02-24-05
BA 4D	W-BEAM GUARDRAIL ANCHOR TYPE I	11-30-06
BA 4E	W-BEAM GUARDRAIL INSTALLATIONS	11-30-06
BA 4F	W-BEAM GUARDRAIL TYPICALS DIVIDED ROADWAYS	01-01-05
BA 4G	W-BEAM GUARDRAIL TYPICAL MULTILANE ARTERIAL	01-01-05
BA 4H	W-BEAM GUARDRAIL TYPICAL 2 LANE 2 WAY	01-01-05
BA 4I	W-BEAM GUARDRAIL BURIED IN BACKSLOPE TERMINAL	01-01-05
BA 4J	W-BEAM GUARDRAIL BURIED IN BACKSLOPE TERMINAL WITH RUB RAIL	01-01-05
BA 4K	W-BEAM GUARDRAIL BURIED IN BACKSLOPE TERMINAL ANCHOR	01-01-05
BA 4L	W-BEAM GUARDRAIL CURVE DETAILS	11-30-06
BA 4M	W-BEAM GUARDRAIL NESTED GUARDRAIL 12' 6" SPAN	01-01-05
BA 4N	W-BEAM GUARDRAIL NESTED GUARDRAIL 18' 9" SPAN	01-01-05
BA 4O	W-BEAM GUARDRAIL NESTED GUARDRAIL 25' SPAN	01-01-05
BA 4P	W-BEAM GUARDRAIL WITH PRECAST BARRIER FOR SPAN > 25'	11-30-06
BA 4Q	NOT USED	
BA 4R	W-BEAM GUARDRAIL MEDIAN BARRIER TRANSITION	10-27-05

DWG. NO.	DESCRIPTION	DATE
BA 4S1	W-BEAM GUARDRAIL WITH MODIFIED CURB AND CURB AND GUTTER	11-30-06
BA 4S2	W-BEAM GUARDRAIL WITH CURB AND GUTTER ≥5"	11-30-06
	Catch Basins and Cleanouts (CB)	
CB 1	CURB AND GUTTER INLET	04-28-05
CB 2	OPEN CURB INLET	04-28-05
CB 3	SHALLOW CATCH BASIN	04-28-05
CB 4	OPEN CURB SHALLOW CATCH BASIN	01-01-05
CB 5A	STANDARD CATCH BASIN AND CLEANOUT BOX	06-30-05
CB 5B	STANDARD CATCH BASIN AND CLEANOUT BOX SECTION	01-01-05
CB 6A	DROP INLET TYPE "A"	01-01-05
CB 6B	BERM APRON WITH DROP INLET TYPE "A"	01-01-05
CB 7A	DROP INLET TYPE "B"	01-01-05
CB 7B	NORMAL APRON WITH DROP INLET TYPE "B"	01-01-05
CB 8A	DOUBLE CATCH BASIN	01-01-05
CB 8B	DOUBLE CATCH BASIN	01-01-05
CB 9A	STANDARD CATCH BASIN AND CLEANOUT BOX SITUATION AND LAYOUT	01-01-05
CB 9B	STANDARD CATCH BASIN AND CLEANOUT BOX SECTION DETAILS	01-01-05
CB 9C	STANDARD CATCH BASIN AND CLEANOUT BOX SCHEDULE OF INSTALLATION 18" TO 42" RCP 12" TO 48" CMP	01-01-05
CB 9D	STANDARD CATCH BASIN AND CLEANOUT BOX SCHEDULE OF INSTALLATION 48" TO 66" RCP 60" TO 78" CMP	01-01-05
CB 10A	STANDARD CATCH BASIN AND CLEANOUT BOX SITUATION AND LAYOUT	01-01-05
CB 10B	STANDARD CATCH BASIN AND CLEANOUT BOX SECTION DETAILS	01-01-05
CB 10C	STANDARD CATCH BASIN AND CLEANOUT BOX SCHEDULE OF INSTALLATION 42" TO 60" RCP 48" TO 72" CMP	01-01-05
CB 11	STANDARD MANHOLE	01-01-05
	Crash Cushions (CC)	
CC 1	CRASH CUSHION MARKINGS	01-01-05
CC 2	CRASH CUSHION DRAINAGE DETAILS GUIDELINE A	01-01-05
CC 3	CRASH CUSHION DRAINAGE DETAILS GUIDELINE B	01-01-05
CC 4	DETAIL FOR PLACEMENT CRASH CUSHIONS TYPE A, B AND D	01-01-05
CC 5A	GRADING AND PLACEMENT DETAILS CRASH CUSHION TYPE C BRAKEMASTER	10-27-05
CC 5B	GRADING AND PLACEMENT DETAILS CRASH CUSHION TYPE C C.A.T.	10-27-05
CC 5C	GRADING AND PLACEMENT DETAILS CRASH CUSHION TYPE C FLEAT-MT	10-27-05
CC 6	CRASH CUSHION TYPE E SAND BARREL DETAILS	01-01-05
CC 7A	GRADING AND INSTALLATION DETAILS CRASH CUSHION TYPE F QUAD TREND 350	02-24-05
CC 7B	CRASH CUSHION TYPE F BEAT-SSCC	08-25-05
CC 8A	GRADING AND INSTALLATION DETAILS CRASH CUSHION TYPE G	11-30-06
CC 8B	GRADING AND INSTALLATION DETAILS FOR "3R" PROJECTS CRASH CUSHION TYPE G	11-30-06
CC 9A	GRADING AND INSTALLATION DETAILS CRASH CUSHION TYPE H	11-30-06
CC 9B	GRADING AND INSTALLATION DETAILS CRASH CUSHION TYPE H (PARABOLIC FLARE)	04-28-05
	Diversion Boxes (DB)	
DB 1A	STANDARD DIVERSION BOX/COVER PLATE/GRATING FOR 18" DIA. OR 24" DIA. PIPE	01-01-05
DB 1B	STANDARD DIVERSION BOX HINGED LID DETAILS FOR 18" DIA. OR 24" DIA. PIPE	01-01-05
DB 1C	STANDARD DIVERSION BOX BICYCLE-SAFE GRATING DETAILS FOR 18" DIA. OR 24" DIA. PIPE	01-01-05
DB 1D	STANDARD DIVERSION BOX THREE GATE BOX SECTIONS FOR 18" DIA. OR 24" DIA. PIPE	01-01-05
DB 1E	STANDARD DIVERSION BOX THREE GATE BOX SECTIONS FOR 18" DIA. OR 24" DIA. PIPE	01-01-05
DB 1F	STANDARD DIVERSION BOX THREE GATE BOX SECTIONS FOR 18" DIA. OR 24" DIA. PIPE	01-01-05
DB 2A	STANDARD DIVERSION BOX W/INTERCHANGEABLE WALLS, BOTTOM SLAB, WALLS AND APRON DETAILS	01-01-05

DWG. NO.	DESCRIPTION	DATE
DB 2B	STANDARD DIVERSION BOX W/INTERCHANGEABLE WALLS, QUANTITIES SCHEDULE	01-01-05
DB 2C	STANDARD DIVERSION BOX W/INTERCHANGEABLE WALLS, HAND SLIDE GATE DETAILS	01-01-05
DB 2D	STANDARD DIVERSION BOX TYPE "G" HAND SLIDE GATE DETAILS	01-01-05
DB 2E	STANDARD DIVERSION BOX HINGED LID (SOLID COVER PLATE) TYPE "A" DETAILS TYPE I PLAN	01-01-05
DB 2F	STANDARD DIVERSION BOX HINGED LID (SOLID COVER PLATE) TYPE "A" DETAILS TYPE II PLAN	01-01-05
DB 2G	STANDARD DIVERSION BOX HINGED LID SOLID COVER TYPE "B" DETAILS	01-01-05
DB 2H	STANDARD DIVERSION BOX HINGED LID SOLID COVER TYPE "B" AND "C" DETAILS	01-01-05
DB 3A	STANDARD DIVERSION BOX WITH MANHOLE COVER SITUATION AND LAYOUT	01-01-05
DB 3B	STANDARD DIVERSION BOX WITH MANHOLE COVER UP TO 42" RCP AND UP TO 54" CMP	01-01-05
DB 3C	STANDARD DIVERSION BOX WITH MANHOLE COVER 48" TO 72" RCP AND 60" TO 84" CMP	01-01-05
DB 4	STANDARD TRANSITION CONCRETE LINED DITCH TO PIPE OR DIVERSION BOX	01-01-05
	Design (DD)	
DD 1	SUPERELEVATION AND WIDENING	01-01-05
DD 2	SURFACE DITCH, BENCHED SLOPE, AND CUT DITCH DETAILS	01-01-05
DD 3	CLIMBING LANES	01-01-05
DD 4	GEOMETRIC DESIGN FOR FREEWAYS (ROADWAY)	04-28-05
DD 5	ENTRANCE AND EXIT RAMPS AT CROSSROADS	01-01-05
DD 6	ENTRANCE AND EXIT RAMP GEOMETRICS	01-01-05
DD 7	FREEWAY CROSSOVER	01-01-05
DD 8	STRUCTURAL GEOMETRIC DESIGN STANDARDS FOR CLEARANCES	01-01-05
DD 9	STRUCTURAL GEOMETRIC DESIGN STANDARDS	01-01-05
DD 10	RAILROAD CLEARANCES AT HIGHWAY OVERPASS STRUCTURES	01-01-05
DD 11	RURAL MULTI LANE HIGHWAYS OTHER THAN FREEWAYS	01-01-05
DD 12	RURAL TWO LANE HIGHWAYS	01-01-05
DD 13	FRONTAGE AND ACCESS ROADS (UNDER 50 ADT)	01-01-05
DD 14	TYPICAL RURAL 2 LANE ROAD WITH MEDIAN LANE AND DECELERATION LANE FOR INTERSECTING CROSSROADS	01-01-05
	Drainage (DG)	
DG 1	FILL HEIGHT FOR METAL PIPE (STEEL)	08-25-05
DG 2	FILL HEIGHT FOR METAL PIPE (ALUMINUM)	01-01-05
DG 3	MAXIMUM FILL HEIGHT FOR HDPE AND PVC PIPES	01-01-05
DG 4	PIPE MINIMUM COVER	01-01-05
DG 5A	PLASTIC PIPE CULVERT INSTALLATION	02-23-06
DG 5B	METAL PIPE OR PIPE ARCH CULVERT INSTALLATION	02-23-06
DG 5C	PRECAST CONCRETE PIPE CULVERT INSTALLATION	02-23-06
DG 6	SAFETY SLOPE END SECTION FOR CIRCULAR AND ARCHED PIPE	02-23-06
DG 7	GASKETTED JOINTS OR COUPLING BANDS FOR CMP	01-01-05
DG 8	METAL CULVERT END SECTION	01-01-05
DG 9	MISCELLANEOUS PIPE DETAILS	01-01-05
	Environmental Controls (EN)	
EN 1	TEMPORARY EROSION CONTROL (CHECK DAMS)	08-25-05
EN 2	TEMPORARY EROSION CONTROL (SILT FENCE)	08-25-05
EN 3	TEMPORARY EROSION CONTROL (SLOPE DRAIN AND TEMPORARY BERM)	08-25-05
EN 4	TEMPORARY EROSION CONTROL (DROP INLET BARRIERS)	08-25-05
EN 5	TEMPORARY EROSION CONTROL (PIPE INLET AND CURB INLET BARRIERS)	08-25-05
EN 6	TEMPORARY EROSION CONTROL (SEDIMENT TRAP AND STABILIZED CONSTRUCTION ENTRANCE)	08-25-05
EN 7	TEMPORARY EROSION CONTROL (STRAW BALE BARRIER)	08-25-05

☒ MARKED BOXES INDICATE DRAWINGS APPLICABLE TO THIS PROJECT

REVISIONS

1	02/24/05	B.A.	CHANGE 1
2	04/28/05	B.A.	CHANGE 2
3	06/30/05	B.A.	CHANGE 3
4	08/25/05	B.A.	CHANGE 4
5	10/27/05	B.A.	CHANGE 5
6	02/23/06	B.A.	CHANGE 6
7	11/30/06	B.A.	CHANGE 8

UTAH DEPARTMENT OF TRANSPORTATION

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

RECOMMENDED FOR APPROVAL

NOV.30.2006

DATE

NOV.30.2006

DATE

APPROVED

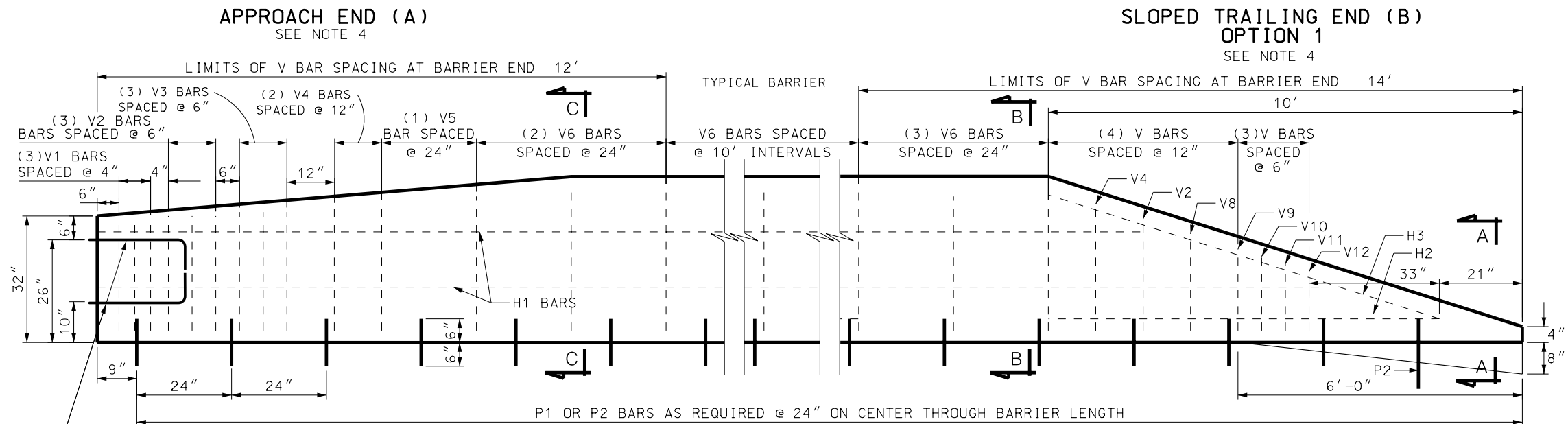
DEPUTY DIRECTOR

STANDARD DRAWING TITLE

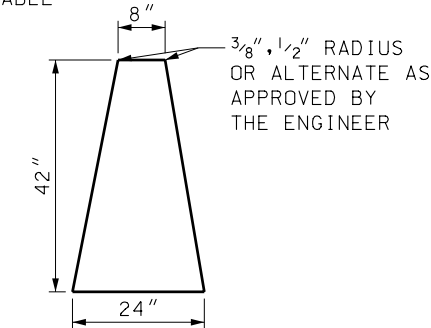
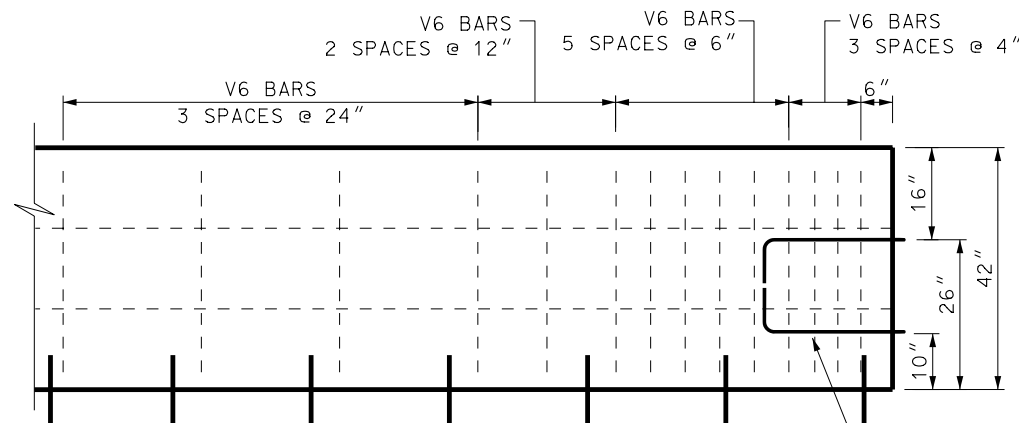
STANDARD DRAWING INDEX SHEET

STD DWG 1-B

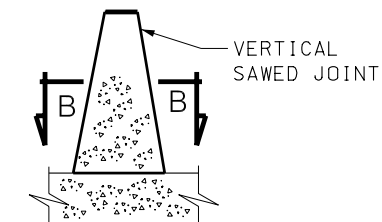
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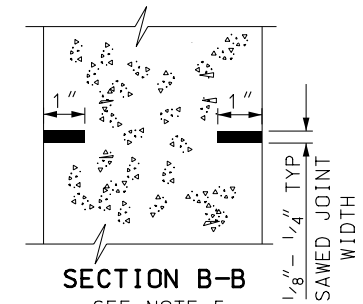
ELEVATION
SEE STD DWG BA 3A2
FOR CROSS SECTIONS AND
REINFORCING STEEL TABLE



TYPICAL SECTION

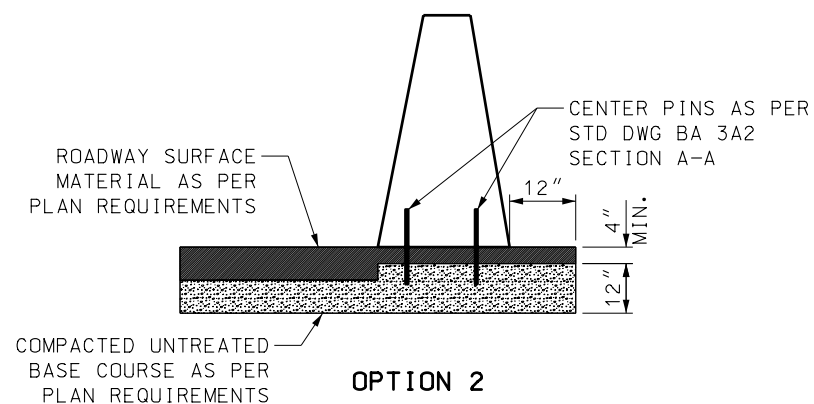
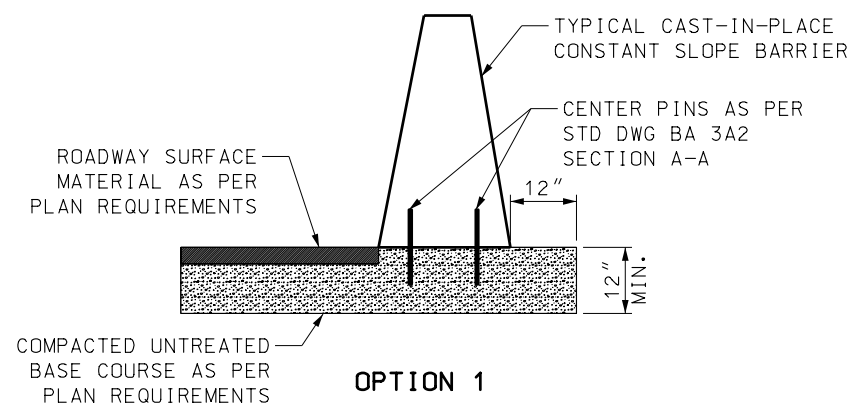


SECTION THROUGH SAWED JOINT
SEE NOTE 5



TRAILING END (C)
OPTION 2
SEE NOTES 4 & 6

INSTALL X CONNECTION AS PER STD DWG BA 3C WHEN TRANSITIONING TO PRECAST CONSTANT SLOPE BARRIER



SUB-BASE REQUIREMENTS

NOTES:

1. THE ENGINEER APPROVES CONTRACTOR DEvised METHOD OF POSITIONING THE LONGITUDINAL REINFORCING STEEL +/- 1/2" AS DIMENSIONED.
2. DO NOT USE TO SUPPORT HIGHWAY LIGHTING POLES. ADDITIONAL SUPPORT DETAILS REQUIRED.
3. DO NOT USE BARRIER FOR BRIDGE APPLICATIONS.
4. CHOOSE APPROPRIATE END TREATMENT:
 - A. CONSTRUCT APPROACH END AS PER DETAIL APPROACH END (A) WHEN CRASH CUSHION INSTALLATION IS REQUIRED.
 - B. CONSTRUCT TRAILING END AS PER DETAIL APPROACH END (A) WHEN CRASH CUSHION INSTALLATION IS REQUIRED.
 - C. CONSTRUCT SLOPED TRAILING END (B) WHEN BARRIER END DOES NOT REQUIRE A CRASH CUSHION, IS OUTSIDE THE MINIMUM REQUIRED CLEAR ZONE, BUT IS WITHIN 1.2 TIMES THE MINIMUM REQUIRED CLEAR ZONE OF APPROACH TRAFFIC.
 - D. USE OF SLOPED END PERMITTED FOR APPROACH TRAFFIC WHEN DESIGN SPEED IS 40 MPH OR LESS.
 - E. FULL HEIGHT BARRIER, TRAILING END OPTION (C), IS ACCEPTABLE WHEN THE END IS OUTSIDE THE 1.2 TIMES MINIMUM REQUIRED CLEAR ZONE OF APPROACH TRAFFIC.
5. SAW CONTRACTION JOINTS AT PAVEMENT TRANSVERSE JOINTS. WHEN INSTALLED WITH ASPHALT PAVEMENT SAW CONTRACTION JOINTS AT 15 FOOT INTERVALS. ADJUST REBAR AT JOINT TO MAINTAIN MINIMUM 2 INCH OFFSET BETWEEN REBAR AND JOINT.
6. V6 BARS PER TRAILING END OPTION 2 AT BOTH SIDES OF CONSTRUCTION JOINT.
7. USE COATED REINFORCEMENT STEEL.
8. USE CLASS AA(AE) CONCRETE.

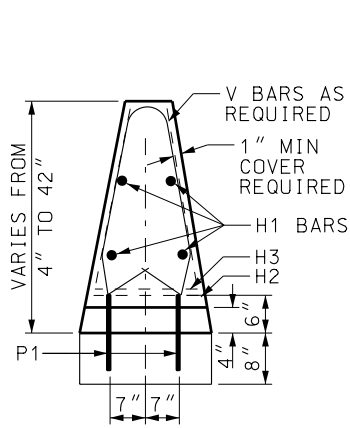
UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

**CAST IN PLACE
CONSTANT SLOPE
BARRIER**

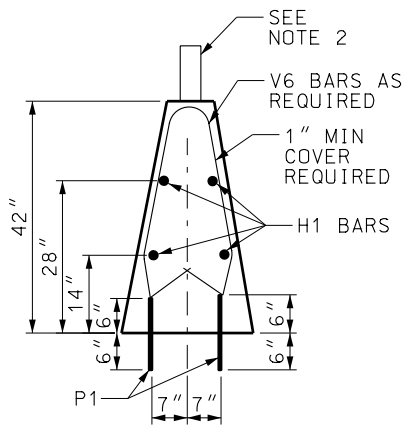
STD DWG
BA 3A1

REVISIONS		NO.	DATE	APPR.	REMARKS
1	11/30/06	G.S.			NEW DRAWING, SPLIT BA 3 INTO 2 DRAWINGS, ADDED SUBBASE REQUIREMENTS, X CONNECTION NOTE OPTION C, BA 3 DELETED.

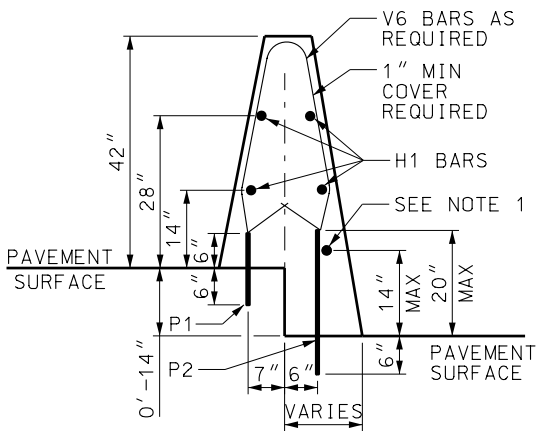
RECOMMENDED FOR APPROVAL
CHAIRMAN STANDARDS COMMITTEE
APPROVED
NOV. 30, 2006
DATE
DEPUTY DIRECTOR
NOV. 30, 2006
DATE



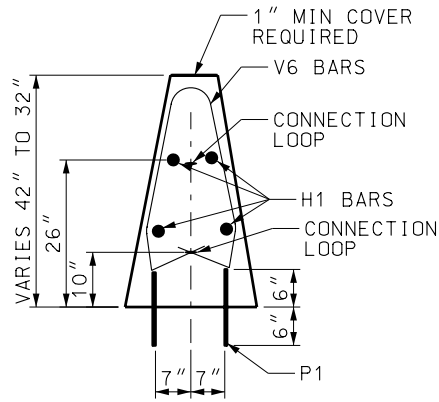
SECTION A-A



SECTION B-B



SECTION B-B
STEPPED PAVEMENT



SECTION C-C

REINFORCING STEEL TABLE						
MARK	BAR SIZE	(NO.) OF BARS				SKETCH
H1	#5	4 OR 5 RUN THROUGH LENGTH OF BARRIER REQUIRED SPLICE LENGTH - 45"				
H2	#5	TRAILING END SECTION (B) BOTTOM SIDE				
H3	#5	TRAILING END SECTION (B) TOP SIDE				
END OPTION		(A)	(B)	(C)	D	
V1	#5	3			28"	
V2	#5	3	1		29"	
V3	#5	3			30"	
V4	#5	2	1		32"	
V5	#5	1			34"	
* V6	#5	2	3	14	36"	
V7	#5		1		25"	
V8	#5		1		22"	
V9	#5		1		20"	
V10	#5		1		18"	
V11	#5		1		16"	
P1	#8	BARRIER TO PAVEMENT				12" LONG PINS @ 24" CENTERS
P2	#8	BARRIER TO PAVEMENT STEPPED PAVEMENT				26" LONG PINS @ 24" CENTERS

*V6 BARS SHOWN IN CHART ARE THE NUMBER OF BARS REQUIRED FOR EACH END OPTION.
SPACE V6 BARS AT 10' INTERVALS THROUGH TYPICAL BARRIER SECTION.

NOTE:

1. ATTACH ADDITIONAL H1 BAR TO P2 BAR WHEN STEPPED PAVEMENT CONFIGURATION REQUIRED.
2. SEE STD DWG GW 9 FOR DELINEATION HARDWARE AND STD DWG GW 10 FOR DELINEATION SPACING.

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

CAST IN PLACE
CONSTANT SLOPE
BARRIER

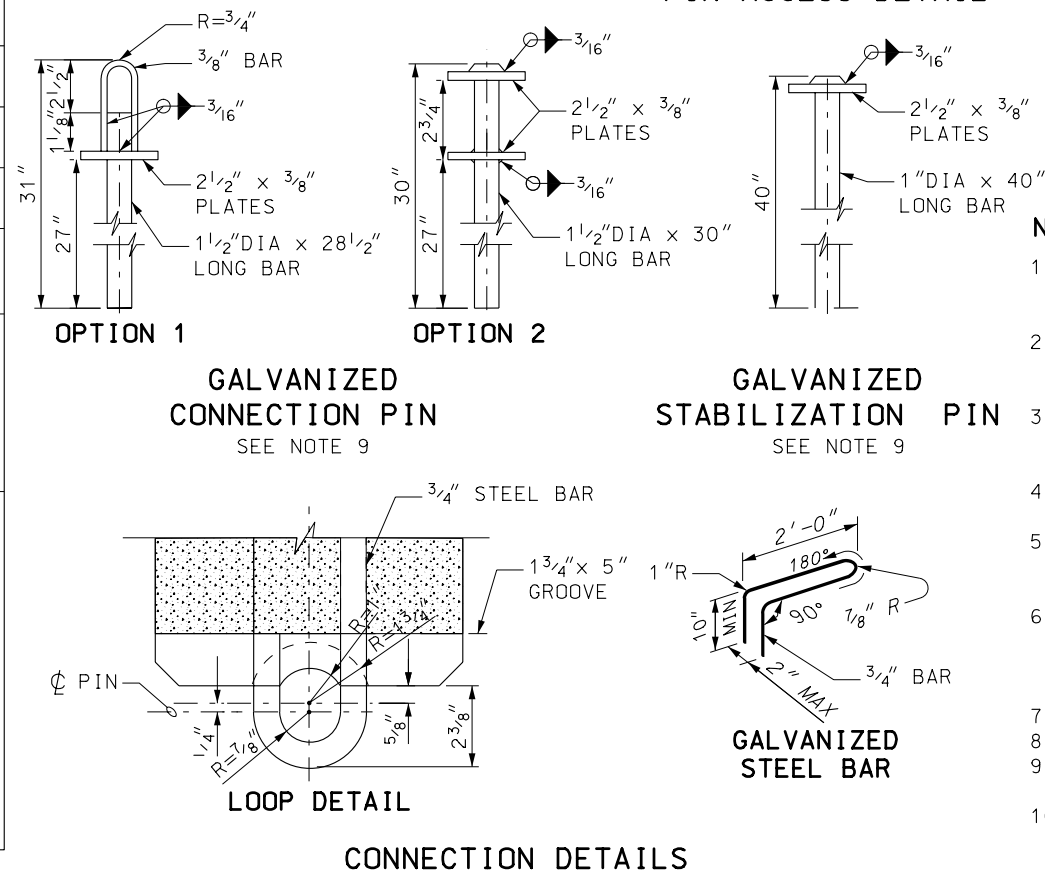
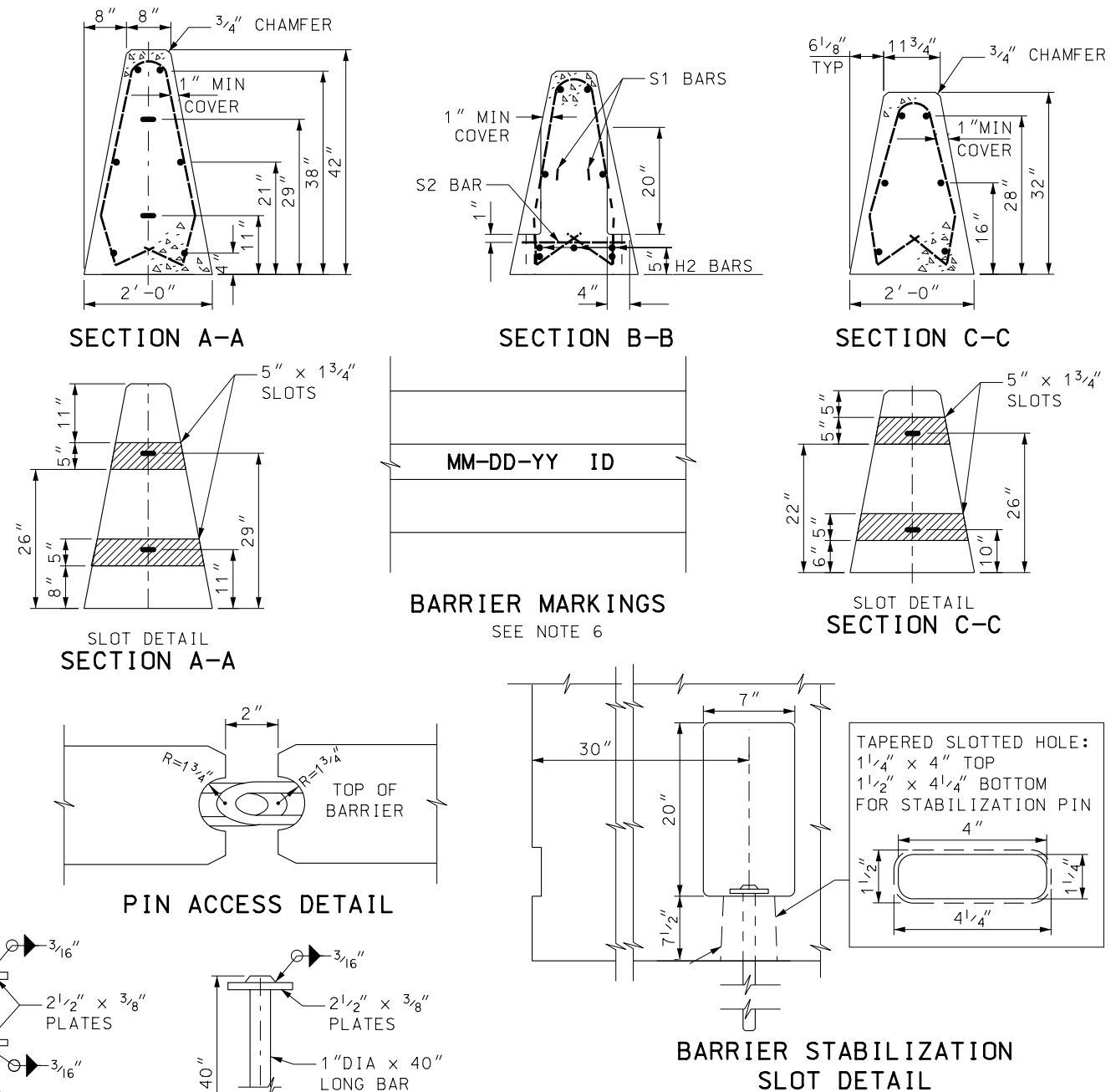
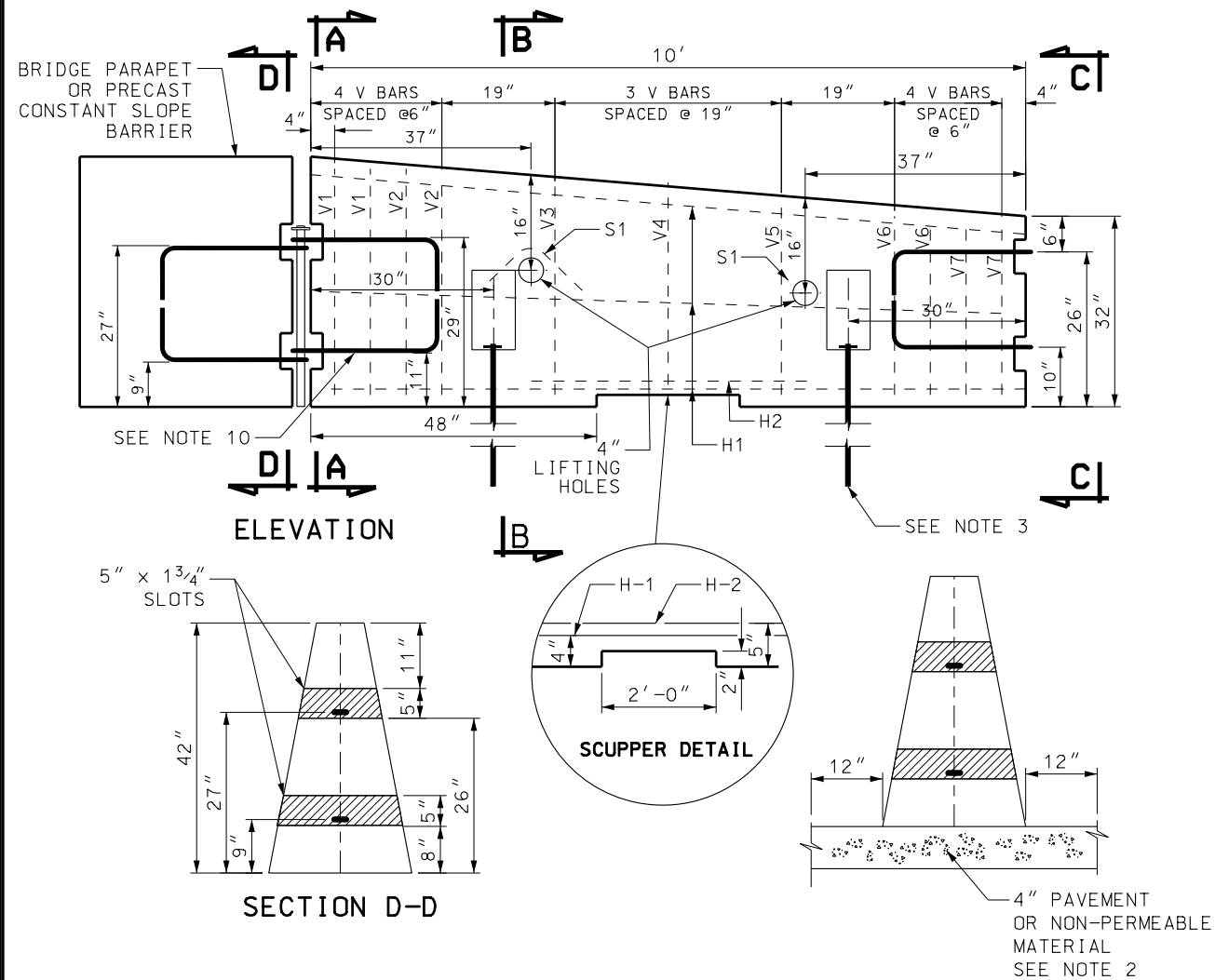
STD DWG
BA 3A2

RECOMMENDED FOR APPROVAL
CHAIRMAN STANDARD COMMITTEE
APPROVED
NOV. 30, 2006
DATE
DEPUTY DIRECTOR
NOV. 30, 2006
DATE

REVISIONS
1 11/30/06 G.S. NEW DRAWING. SPLIT DETAILS FROM BA 3A.

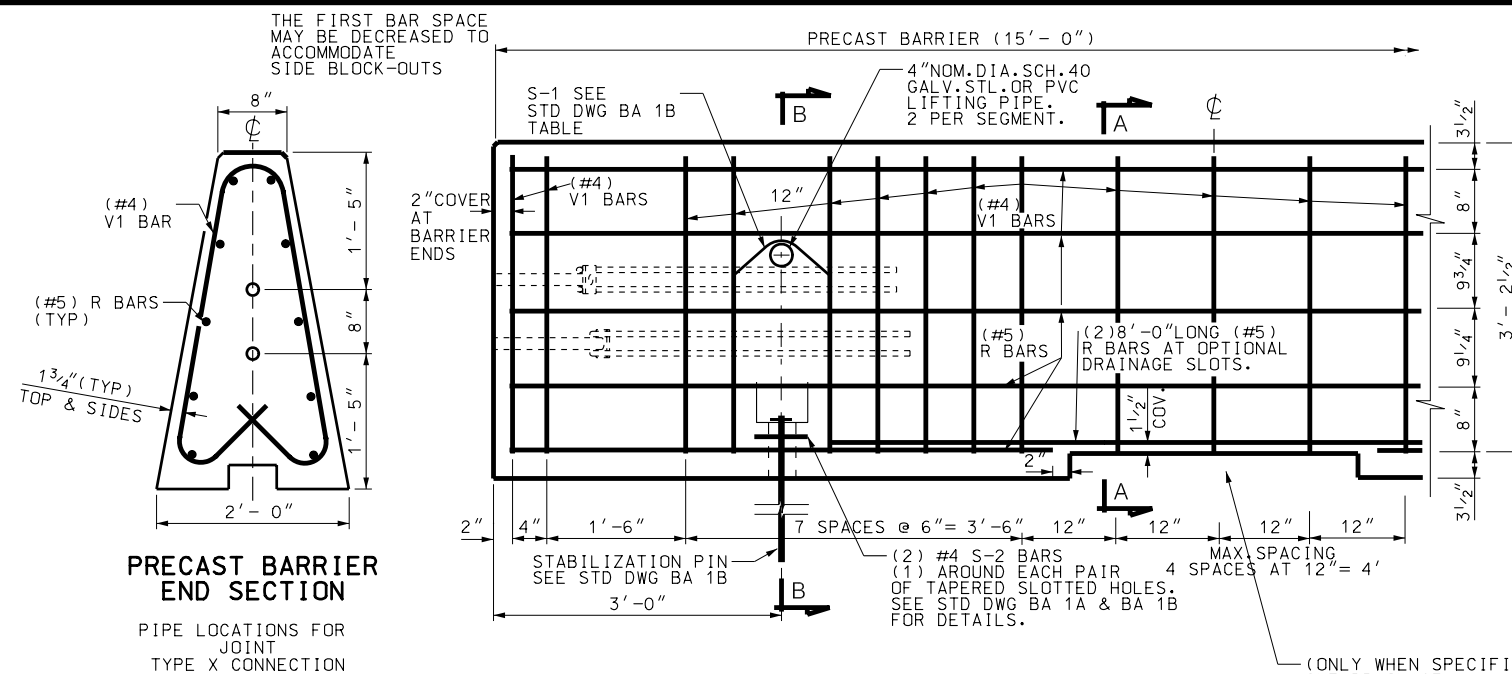
REMARKS

NO. DATE APPR.

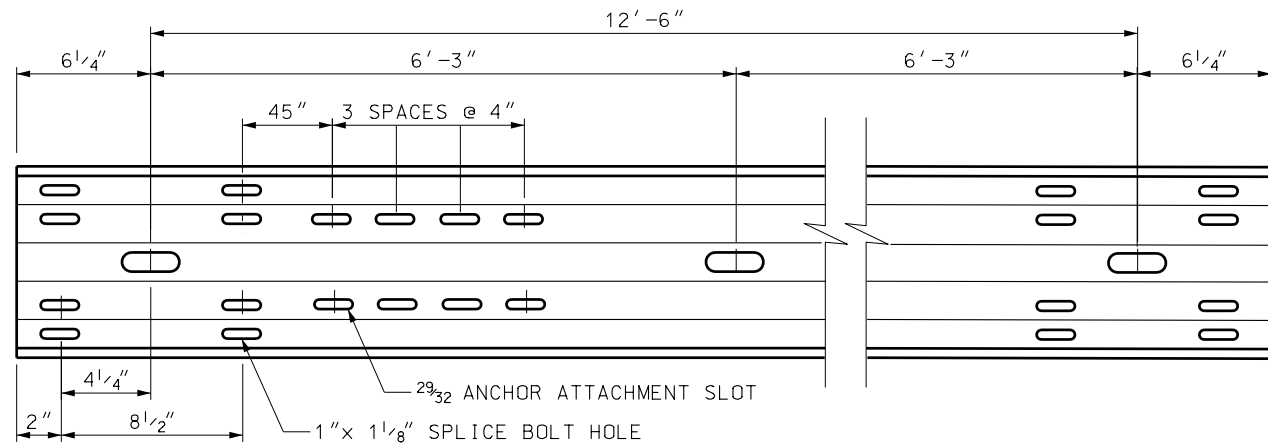


- ## NOTES:
1. TRANSITION SECTION REQUIRED WHEN A CRASH CUSHION OR W-BEAM GUARDRAIL TRANSITION IS REQUIRED ON A CONSTANT SLOPE BRIDGE PARAPET.
 2. PROVIDE 4" OF PAVEMENT OR NON-PERMEABLE MATERIAL 1' IN FRONT OF AND 1' ON BOTH SIDES OF TRANSITION SECTION. PLACE TRANSITION SECTION ON TOP OF FINAL PAVEMENT COURSE.
 3. ALL APPLICATIONS REQUIRE THE INSTALLATION OF STABILIZATION PINS AND CONNECTION PINS. PRE DRILL 1" HOLE THROUGH PAVEMENT SURFACE PRIOR TO INSTALLING STABILIZATION PINS.
 4. USE A 4" WHITE PVC SLEEVE TO FORM THE LIFTING HOLES. LEAVE SLEEVE IN PLACE AFTER CASTING.
 5. PLACE AN ADEQUATE AMOUNT OF SILICONE ADHESIVE ON BOTTOM OF WASHER BEFORE INSERTING PIN TO HOLD IN PLACE AND PREVENT EASY HAND REMOVAL.
 6. MARK EACH TRANSITION SECTION WITH 1 1/2" NUMBERS INDICATING THE DATE OF CASTING AND IDENTIFICATION NUMBER SUPPLIED BY THE INSPECTOR, IMPRESSED 1/4" DEEP INTO THE TOP CENTER OF THE BARRIER.
 7. USE COATED REINFORCEMENT STEEL.
 8. USE CLASS AA(AE) CONCRETE.
 9. USE OF A HOT FORGED HEAD, MEETING PLATE SIZE AND THICKNESS IS ACCEPTABLE IN PLACE OF A WELDED PLATE.
 10. INSTALL TYPE X JOINT CONNECTION AS PER STD DWG BA 3C WHEN ATTACHING TRANSITION SECTION TO PRE-CAST CONSTANT SLOPE BARRIER.

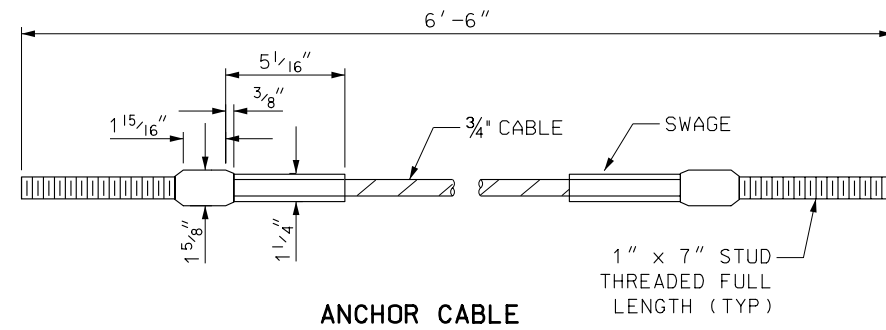
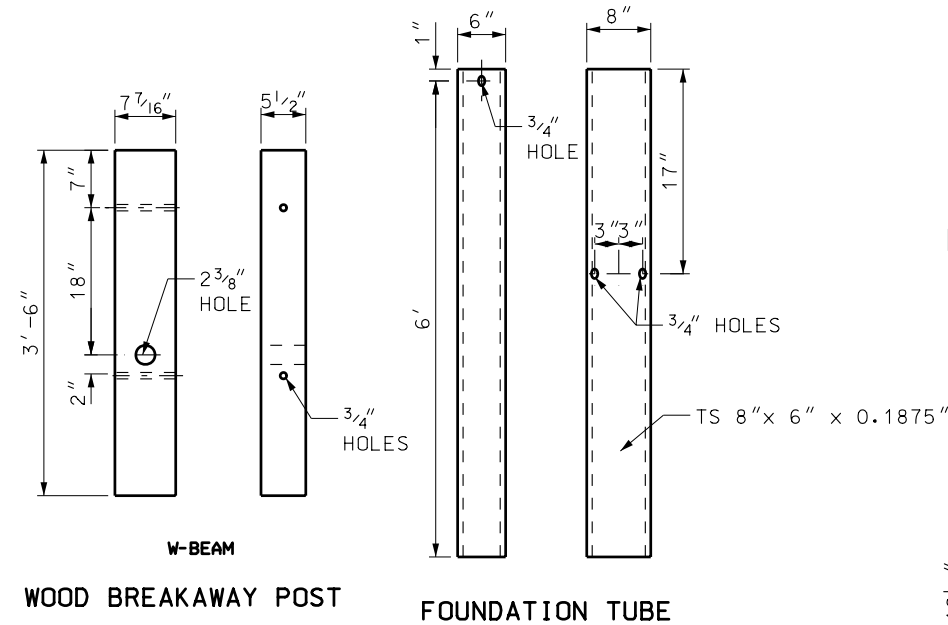
PRECAST CONCRETE CONSTANT SLOPE TRANSITION SECTION FOR CRASH CUSHION AND W-BEAM GUARDRAIL STANDARD DRAWING TITLE		UTAH DEPARTMENT OF TRANSPORTATION STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION SALES, MARKETING, DESIGN		REVISIONS 1 02/24/05 G.S. NEW DRAWING. 2 08-25-05 G.S. ADDED NOTE 9, CORRECTED CONNECTION P.I.N OPTION 1 DIMENSIONS, CHANGED WELDING INFORMATION ON P.I.N DETAIL. 3 11/30/06 G.S. ADDED NOTE 10.	
STD DWG BA 3B		RECOMMENDED FOR APPROVAL  NOV. 30, 2006 DATE		NO. DATE APPR. REMARKS	
		CHAIRMAN STANDARDS COMMITTEE APPROVED  NOV. 30, 2006 DATE			
		DEPUTY DIRECTOR			



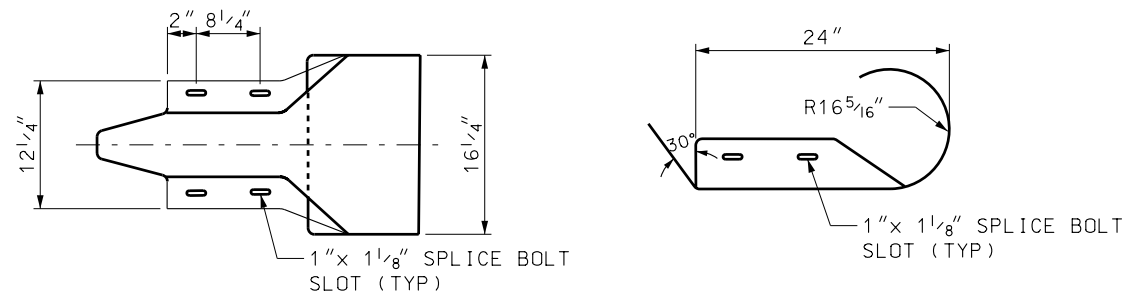
18-DEC-2006 DGN File: L:\Standard Drawings\Impervial\2005\Approved\Change8\Approved\BA4D.dgn



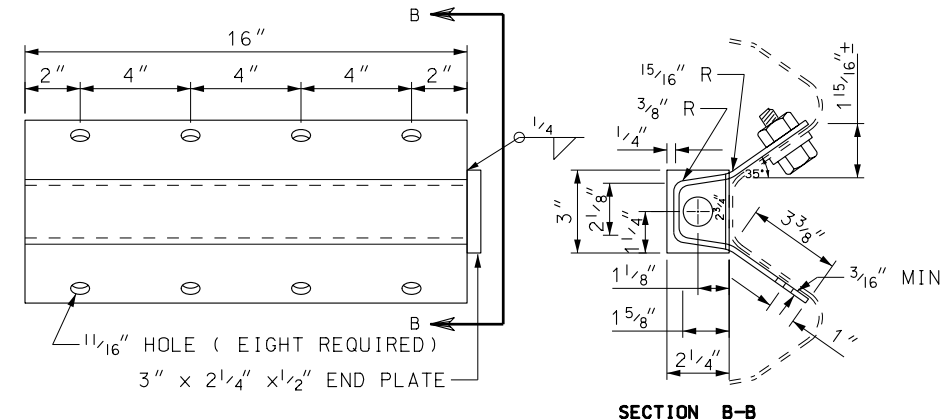
RAIL ELEMENT



ANCHOR CABLE



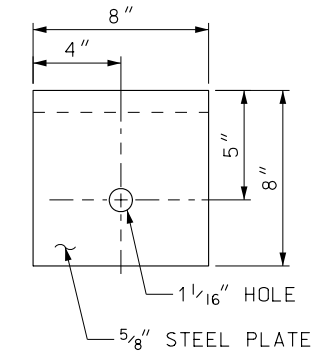
END SECTION (ROUNDED)



ELEVATION

ANCHOR PLATE

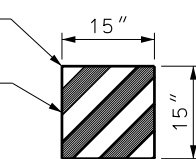
3/16" x 1" x 8" PLATE
TACK WELD TO 5/8" PLATE



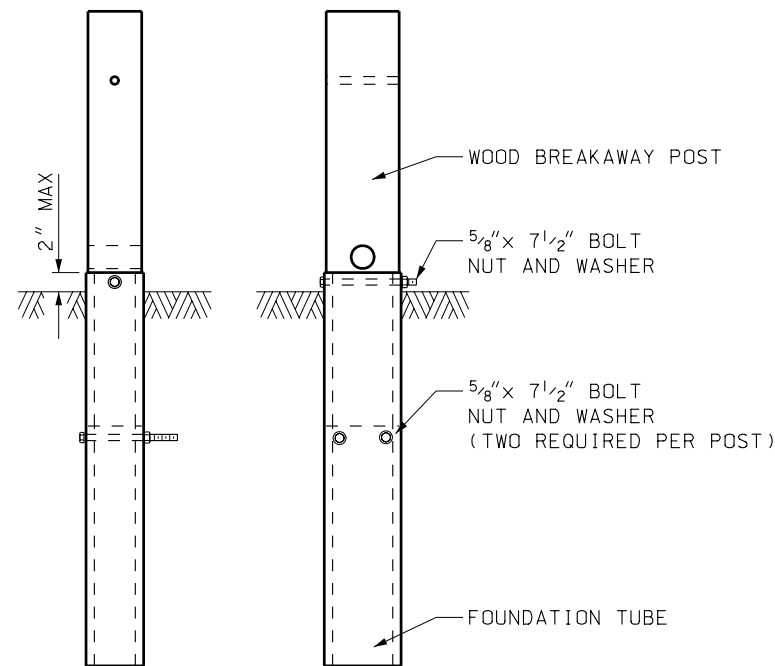
BEARING PLATE

NOTE:
INSTALL BEARING PLATE WITH
5" PORTION UP. SECURE PLATE
TO POST USING TWO NAILS AT
TOP OF PLATE.

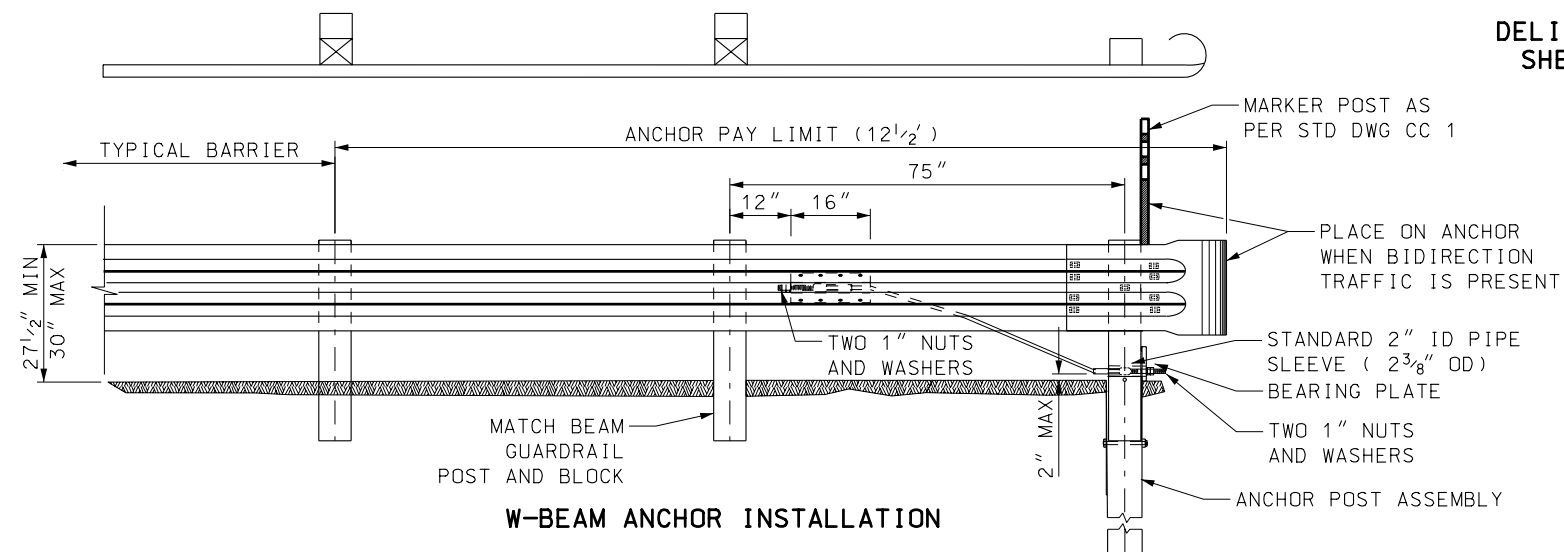
PLACE ON END
SECTION
USE THE APPROPRIATE
SELF ADHESIVE TYPE 3
OBJECT MARKER SHEETING.



DEL INEATION
SHEETING



ANCHOR POST ASSEMBLY



W-BEAM ANCHOR INSTALLATION

REVISIONS				REMARKS			
1	10/27/05	G.S.	REMOVED SOIL PLATE REQUIREMENT. REVISED W-BEAM ANCHOR INSTALLATION DETAIL. REVISED DIMENSIONS ON BREAKAWAY POST AND FOUNDATION TUBE.				
2	11/30/06	G.S.	ADDED DELINEATION MARKER AND POST TO W-BEAM ANCHOR INSTALLATION.				
				NO.	DATE	APPR.	

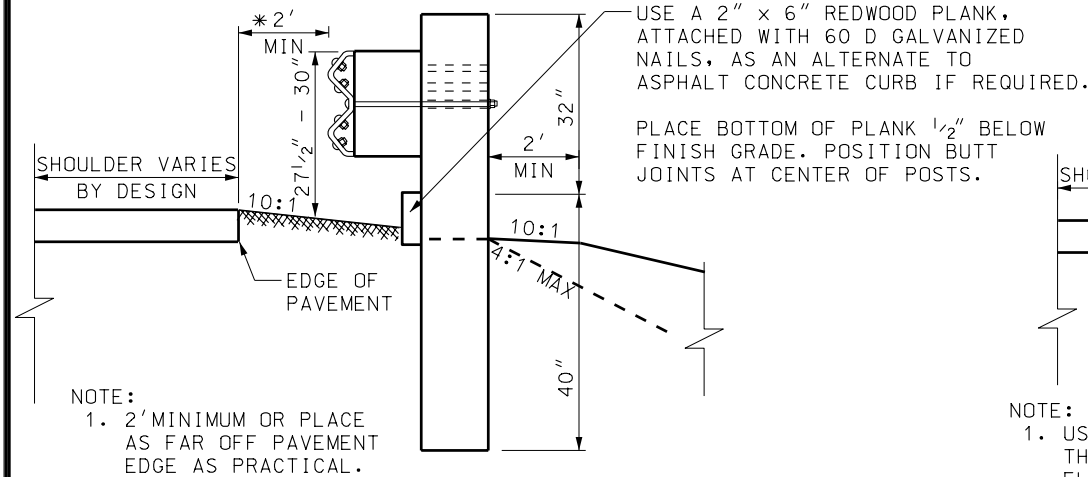
UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

W-BEAM GUARDRAIL
ANCHOR
TYPE I

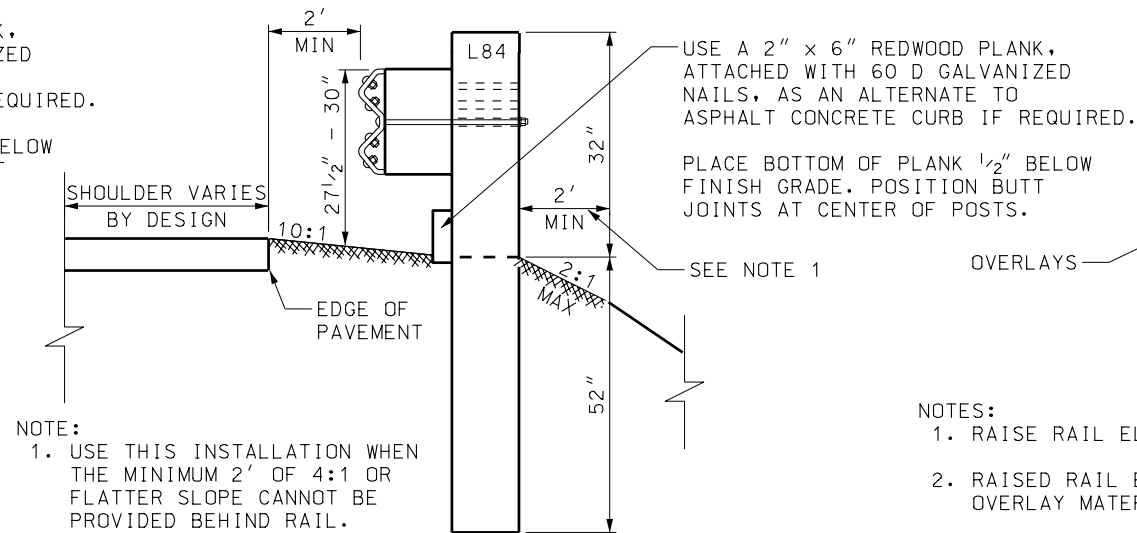
STD DWG
BA 4D

RECOMMENDED FOR APPROVAL
CHAIRMAN STANDARDS COMMITTEE
APPROVED
NOV. 30, 2006
DEPUTY DIRECTOR
DATE

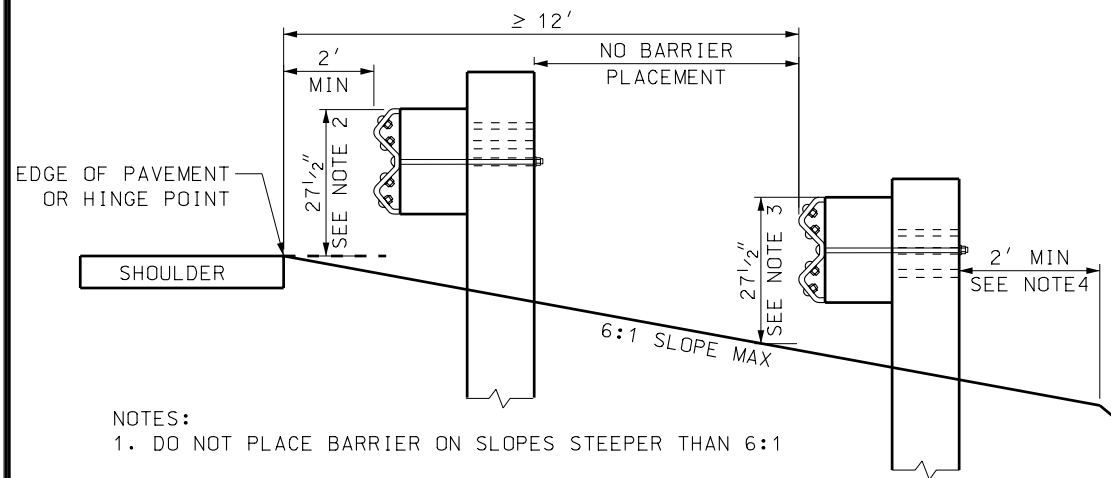
18-DEC-2006 DGN File: L:\Standard Drawings\Impervial\2005\Approved\Change8\Approved\ba4e.dgn



INITIAL INSTALLATION
USE 72" LONG POSTS

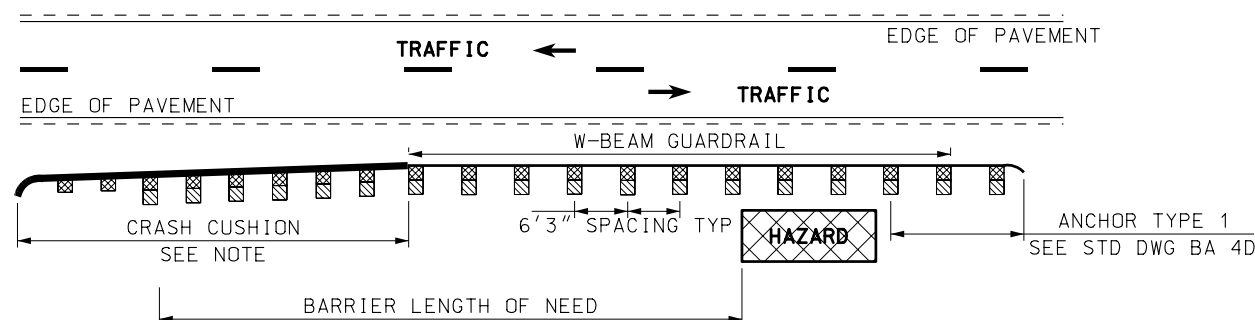


INITIAL LONG POST INSTALLATION
USE 84" LONG POSTS



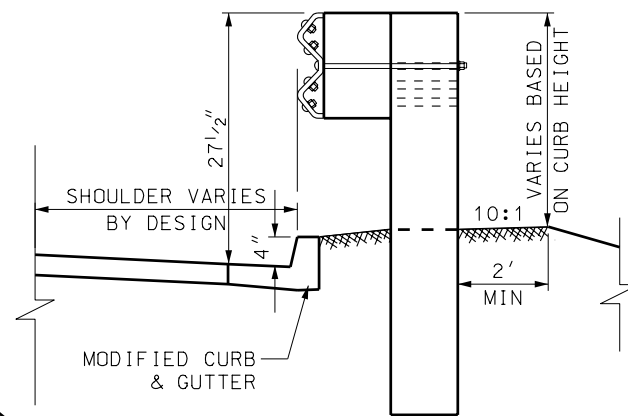
- NOTES:
- DO NOT PLACE BARRIER ON SLOPES STEEPER THAN 6:1
 - MEASURE RAIL HEIGHT FROM SHOULDER LINE OR HINGE POINT EXTENDED. USE BOTTOM BOLT HOLE FOR BLOCK AND RAIL ATTACHMENT.
 - MEASURE RAIL HEIGHT FROM GROUND LINE WHEN BARRIER IS PLACED 12 FEET OR GREATER FROM EDGE OF SHOULDER. USE CENTER BOLT HOLE FOR BLOCK AND RAIL ATTACHMENT.
 - USE 84 INCH POST IF THE 6:1 SLOPE CANNOT BE MAINTAINED 2 FEET BEHIND THE LINE POSTS.

BARRIER INSTALLATION ON 6:1 SLOPE

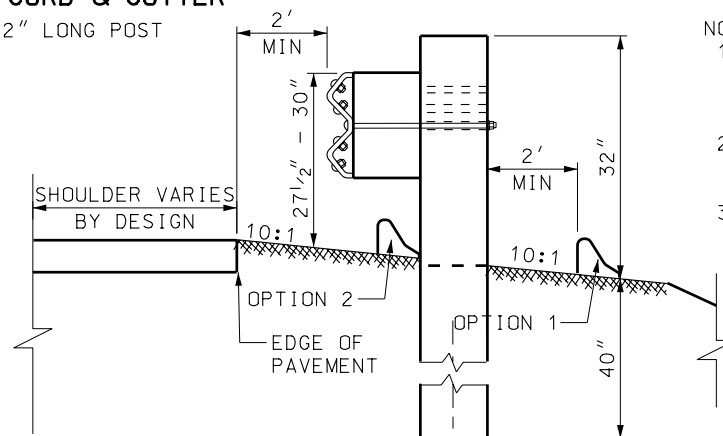


- NOTE:
- CRASH CUSHION REQUIRED WHEN BARRIER END IS WITHIN 1.2 TIMES AASHTO ROADSIDE DESIGN GUIDE CLEAR ZONE.

TYPICAL INSTALLATION

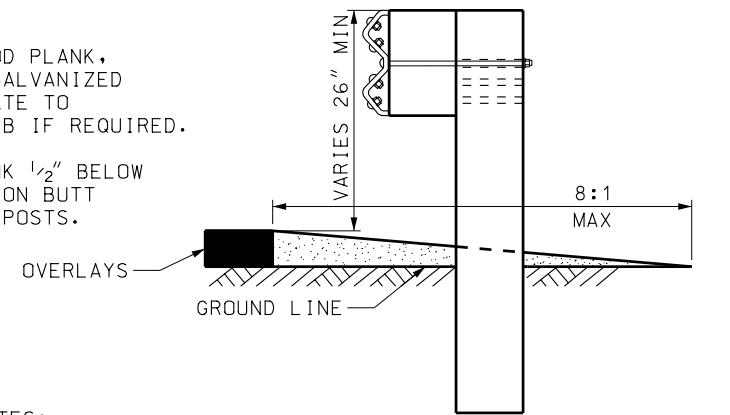


INSTALLATION W/MODIFIED
TYPE B1 CURB & GUTTER
USE 72" LONG POST



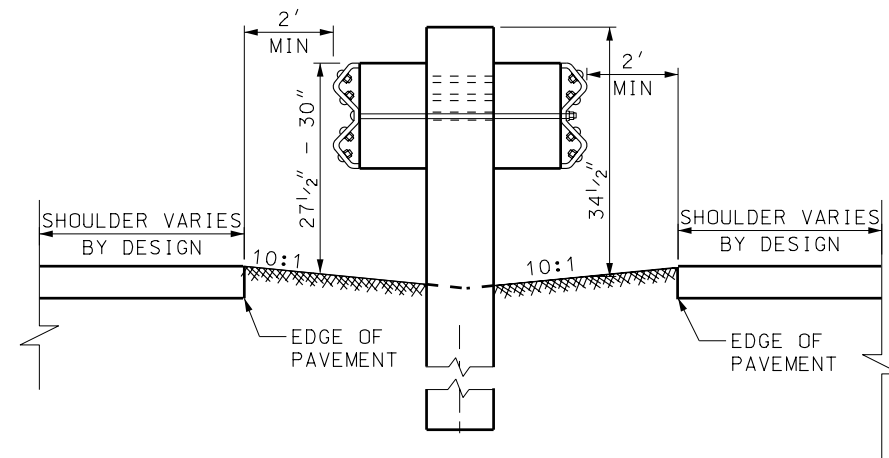
- OPTION 1: PREFERRED INSTALLATION.
- OPTION 2: PLACE FACE OF ASPHALT CONCRETE CURB BEHIND FACE OF RAIL. 2" MAXIMUM CURB HEIGHT WHEN USED IN FRONT OF POST.

INSTALLATION
W/ASPHALT CONCRETE CURB



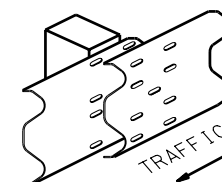
- NOTES:
- RAISE RAIL ELEMENT WHEN OVERLAY IS REQUIRED.
 - RAISED RAIL ELEMENT WILL ACCOMMODATE 6" TO 8" OF OVERLAY MATERIAL.
 - SLOPE OF SHOULDER INTO FACE OF RAIL NOT TO EXCEED 8:1.
 - RAISE REDWOOD PLANKING WHEN REQUIRED.
 - RAISING THE RAIL ELEMENT TO MAXIMUM HEIGHT REQUIRED BEFORE THE MINIMUM HEIGHT OF THE RAIL ELEMENT ABOVE GROUND LEVEL CAN BE REDUCED TO THE MINIMUM OF 25".

RAIL ELEMENT RAISED



- NOTES:
- IF MEDIAN BARRIER IS PLACED 10' OR GREATER FROM TRAVEL LANES USE TOP HOLE TO MOUNT BLOCK & RAIL.
 - RAISE BOTH RAIL ELEMENTS AS PER RAIL ELEMENT RAISED DETAIL, WHEN REQUIRED.
 - ATTACH REQUIRED DELINEATION ON THE POST.

MEDIAN BARRIER



SPLICE LAP DETAIL

REVISIONS		DATE	APPR.	NO.	REMARKS
1	11/30/06	G.S.			ADDED NOTE UNDER CURB AND GUTTER DETAIL-REVISED ASPHALT CONCRETE CURB OPTION 2-REVISED BARRIER ON 6:1 SLOPE DETAIL.

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

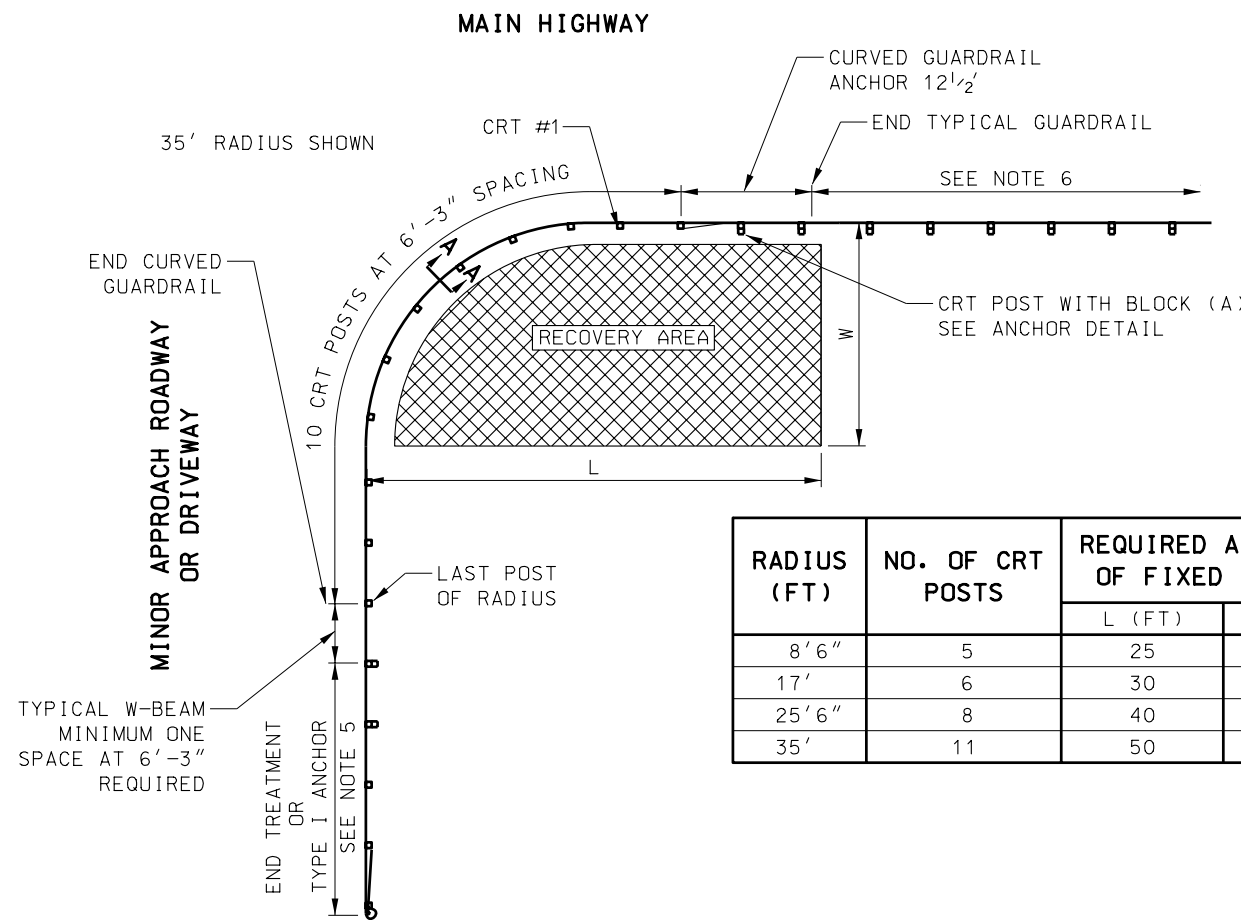
RECOMMENDED FOR APPROVAL
SALVADOR
CHAIRMAN STANDARDS COMMITTEE
APPROVED
NOV. 30, 2006
DEPUTY DIRECTOR

W-BEAM GUARDRAIL
INSTALLATIONS

STD DWG
BA 4E

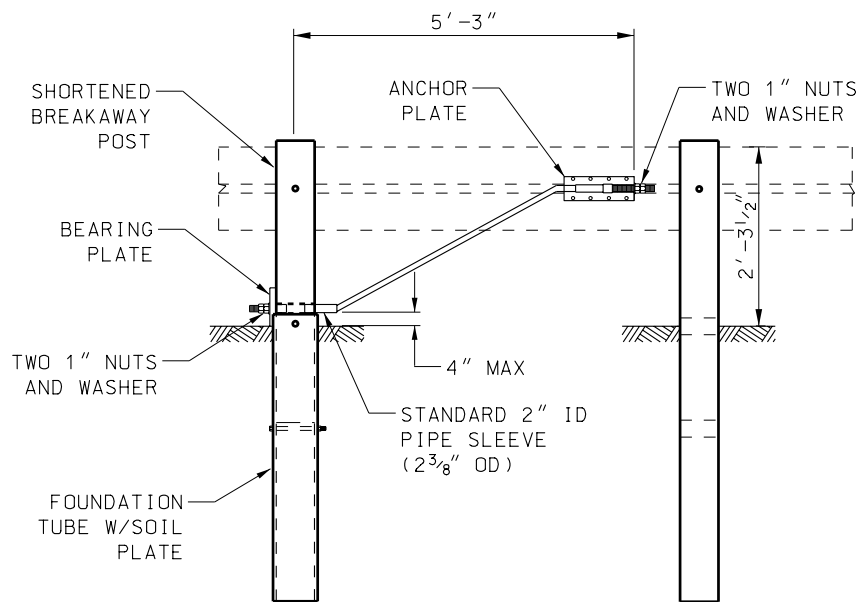
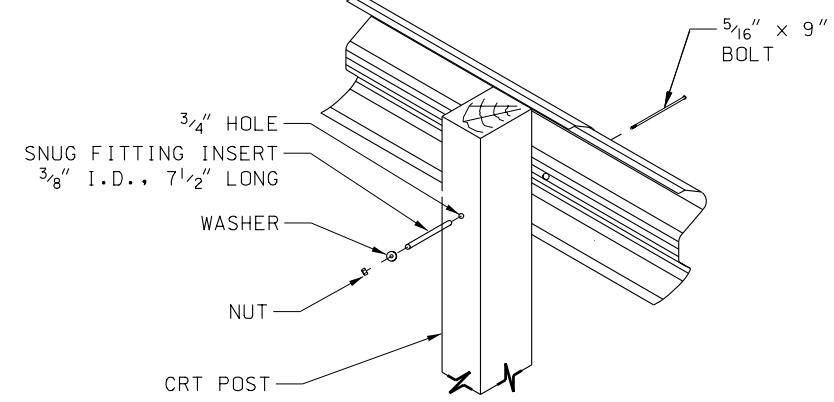
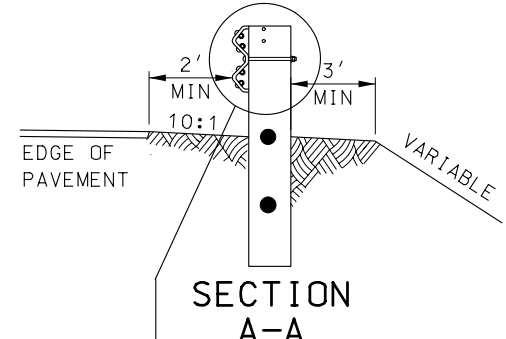
STANDARD DRAWING TITLE

18-DEC-2006 DGN File: L:\Standard Drawings\Imperial\2005\Approved\Change8\Approved\BA24L.dgn

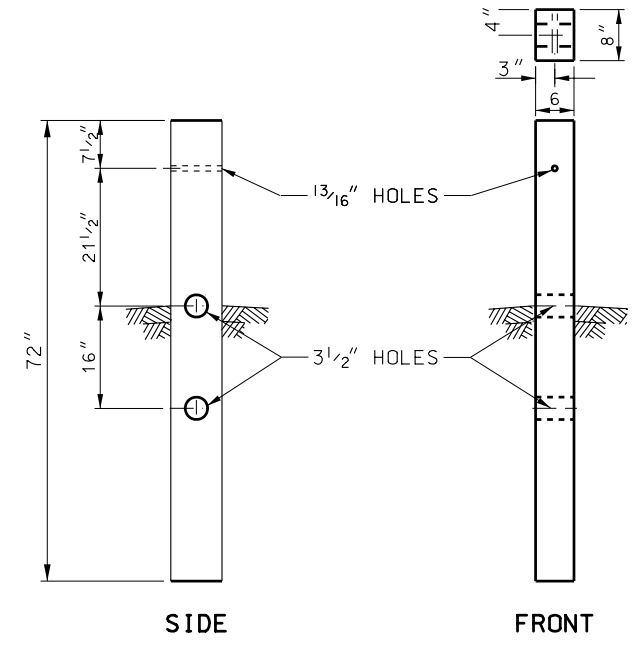


RADIUS (FT)	NO. OF CRT POSTS	REQUIRED AREA FREE OF FIXED OBJECTS	
		L (FT)	W (FT)
8' 6"	5	25	15
17'	6	30	15
25' 6"	8	40	20
35'	11	50	20

- NOTES:**
1. LIST RADIUS REQUIREMENT FOR EACH LOCATION IN THE PROJECT PLANS AND SUMMARY SHEET.
 2. SHOP BEND RADIUS ELEMENTS. FIELD BENDING IS NOT PERMITTED.
 3. RECOVERY AREA BEHIND THE GUARDRAIL TO BE MAINTAINED FREE OF FIXED OBJECTS.
 4. MAINTAIN 10:1 SLOPE IN FRONT OF CURVED SECTION.
 5. USE END TREATMENTS, TYPE "G" OR "H" ON INTERSECTING ROADWAYS OPEN TO THE GENERAL PUBLIC. USE ANCHOR TYPE I (REFER TO STD DWG BA 4D) ON BUSINESS/RESIDENTIAL DRIVEWAYS, OR RESTRICTED/LIMITED ENTRY ROADWAYS.
 6. DO NOT ATTACH DIRECTLY TO W-BEAM GUARDRAIL TRANSITION, BA 4B, INSTALL 12 1/2 FEET OF TYPICAL W-BEAM GUARDRAIL AT END OF TRANSITION PRIOR TO INSTALLING CURVED GUARDRAIL ANCHOR.
 7. USE ANCHOR TYPE I WHEN OPPOSING TRAFFIC IS 1.2 TIMES FROM THE REQUIRED CLEAR ZONE.
 8. USE NOMINAL DIMENSIONS FOR ALL TIMBER.

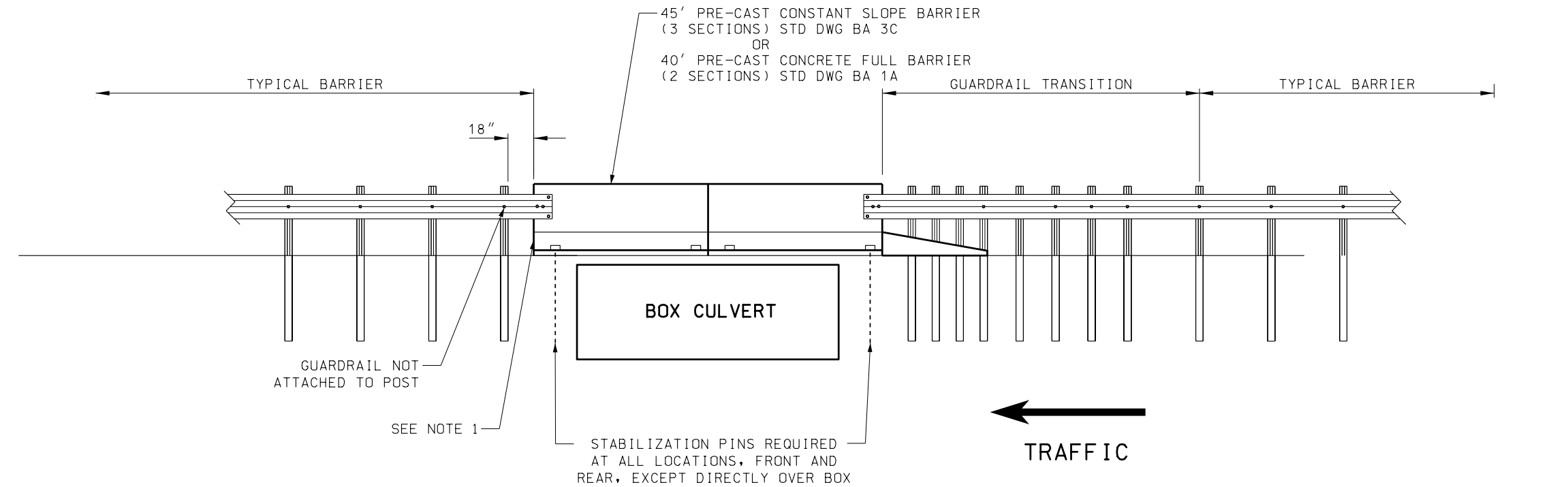


CURVED GUARDRAIL ANCHOR
(REFER TO STD DWG BA 4D)

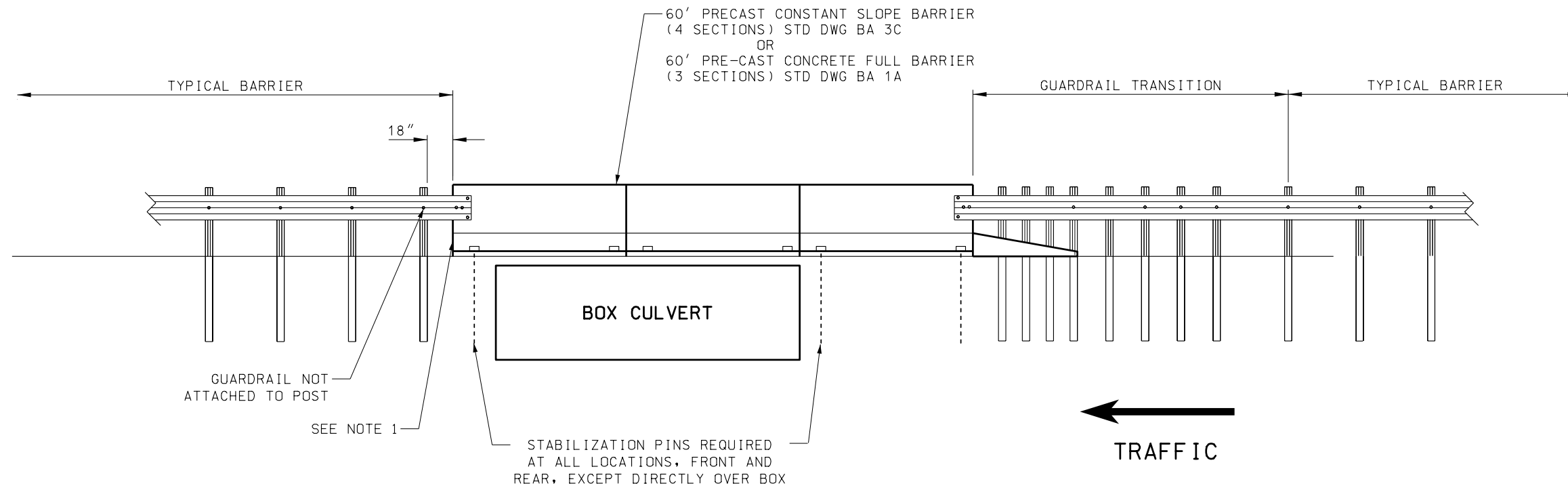


CONTROLLED RELEASE TERMINAL (CRT) POST
SEE NOTE 7

UTAH DEPARTMENT OF TRANSPORTATION		STANDARD DRAWING TITLE	
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION		W-BEAM GUARDRAIL CURVE DETAILS	
RECOMMENDED FOR APPROVAL		CHAIRMAN STANDARDS COMMITTEE	
NOV. 30, 2006		NOV. 30, 2006	
DATE		DATE	
REMARKS		REMARKS	
NO.		NO.	
DATE		DATE	
APPR.		APPR.	
G.S.		G.S.	
11/30/06		11/30/06	
REVISED ANCHOR CABLE PLACEMENT.		REVISED ANCHOR CABLE PLACEMENT.	



DETAIL A
BOX CULVERT $>25'$ & $\leq 30'$



DETAIL B
BOX CULVERT $>30'$

NOTE:

1. INSTALL W-BEAM TRANSITION WHEN TRAFFIC FROM THE OPPOSITE APPROACH IS WITHIN 1.2 TIMES CLEAR ZONE REQUIREMENT.

REVISIONS			
1	11/30/06	G.S.	ADDED NOTE 1.

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

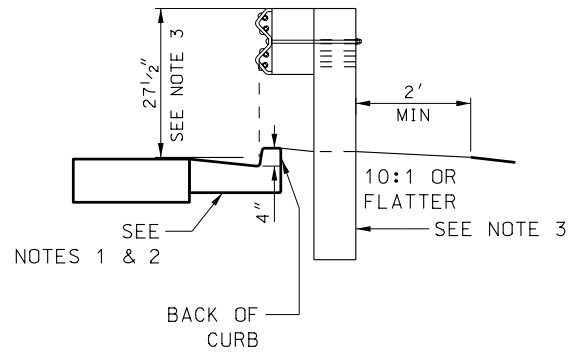
RECOMMENDED FOR APPROVAL
SALESMAN
CHAIRMAN STANDARDS COMMITTEE
APPROVED
NOV. 30, 2006
DATE
NOV. 30, 2006
DATE
DEPUTY DIRECTOR

W-BEAM GUARDRAIL
WITH PRECAST BARRIER
FOR SPAN $> 25'$

STANDARD DRAWING TITLE

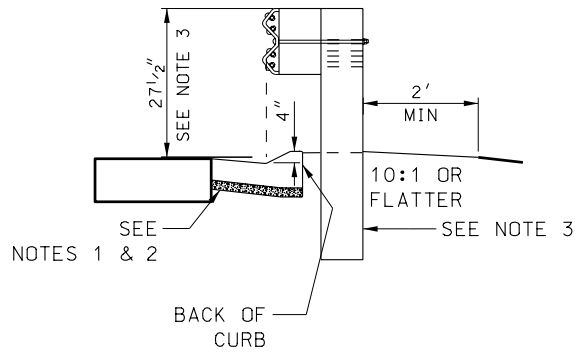
STD DWG
BA 4P

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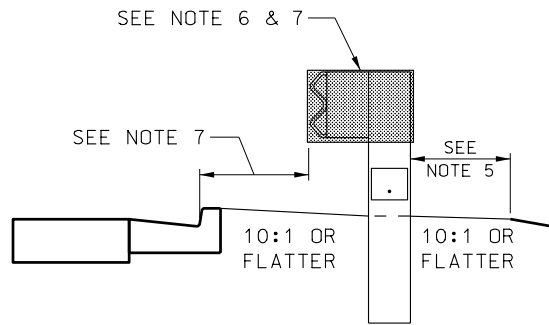
SECTION A-A

W-BEAM GUARDRAIL
MODIFIED TYPE B1 CURB AND GUTTER



SECTION A-A

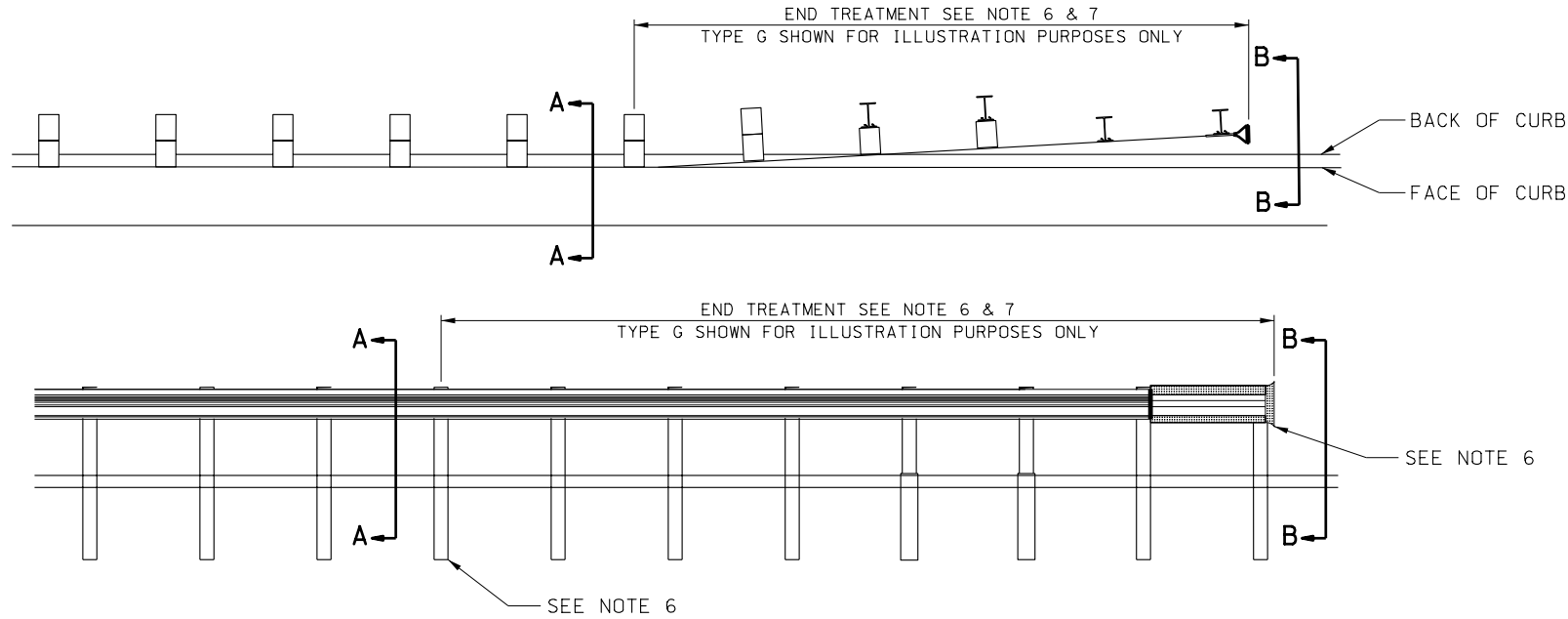
W-BEAM GUARDRAIL
TYPE M1 CURB AND GUTTER



SECTION B-B

NOTES:

1. MEET REQUIREMENTS OF STD DWG GW 2 PRIOR TO INSTALLING CURB AND/OR CURB AND GUTTER WITH W-BEAM GUARDRAIL.
2. MODIFY CURB AND CURB AND GUTTER TO A MAXIMUM OF 4 INCHES AT FACE OF CURB.
3. DRIVE GUARDRAIL POST TO THE DEPTH REQUIRED TO ATTACH BLOCK AND RAIL AT THE TOP HOLE OF THE POST. SET RAIL HEIGHT AT FACE OF CURB FROM TRAVELWAY SURFACE EXTENDED, WHEN RAIL ELEMENT IS AT FACE OF CURB.
4. INSTALL IN A MANNER THAT FACE OF W-BEAM RAIL IS FLUSH WITH FACE OF CURB.
5. CONSTRUCT PAD AS PER APPLICABLE CC STD DWG.
6. ATTACH END TREATMENT AT LAST POST OF TYPICAL RUN. GRADUALLY RAISE END TREATMENT RAIL ELEMENT TO MEET HEIGHT REQUIRED BY THE MANUFACTURER AT END TREATMENT HEAD. THIS APPLIES TO END TREATMENT TYPES "G" AND "H" SYSTEMS.
7. OFFSET END TREATMENT AS PER APPLICABLE CC STD DWG.
A. TYPE "G" TYPICAL OFFSET 2 FEET.
B. TYPE "H" TYPICAL OFFSET 4 FEET.



TYPE B1 AND TYPE M1 SHOWN AS EXAMPLES
4 INCH MAXIMUM HEIGHT FOR ALL CURBS
AND/OR CURB AND GUTTER TYPES

W-BEAM GUARDRAIL& END TREATMENT INSTALLATION WITH MODIFIED CURBS AND/OR CURB AND GUTTER TYPES

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

W-BEAM GUARDRAIL
WITH MODIFIED
CURB AND
CURB AND GUTTER

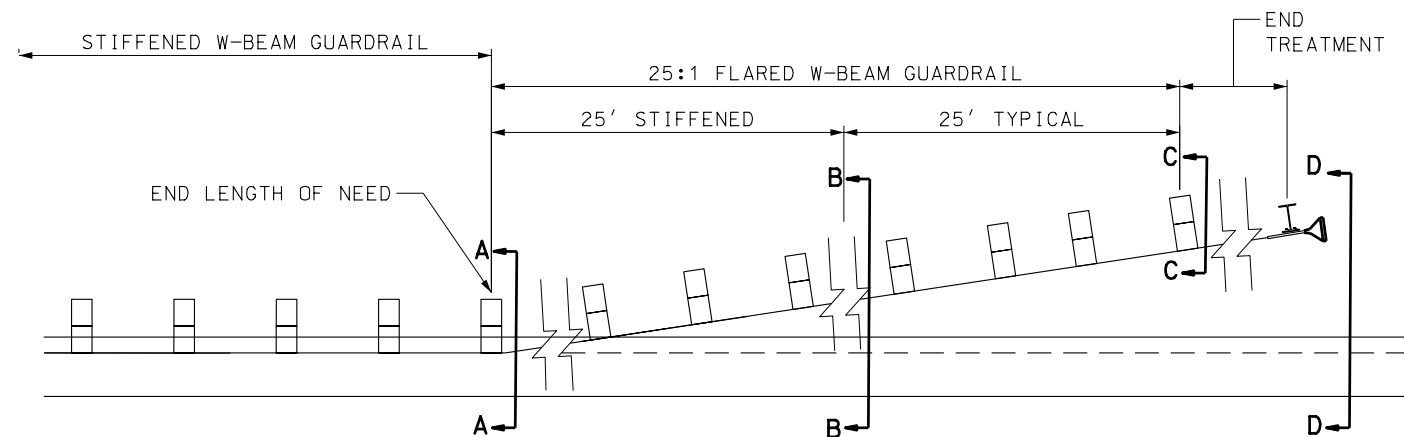
STD DWG
BA 451

RECOMMENDED FOR APPROVAL
CHAIRMAN STANDARDS COMMITTEE
APPROVED
NOV. 30, 2006
DATE
DEPUTY DIRECTOR
NOV. 30, 2006
DATE

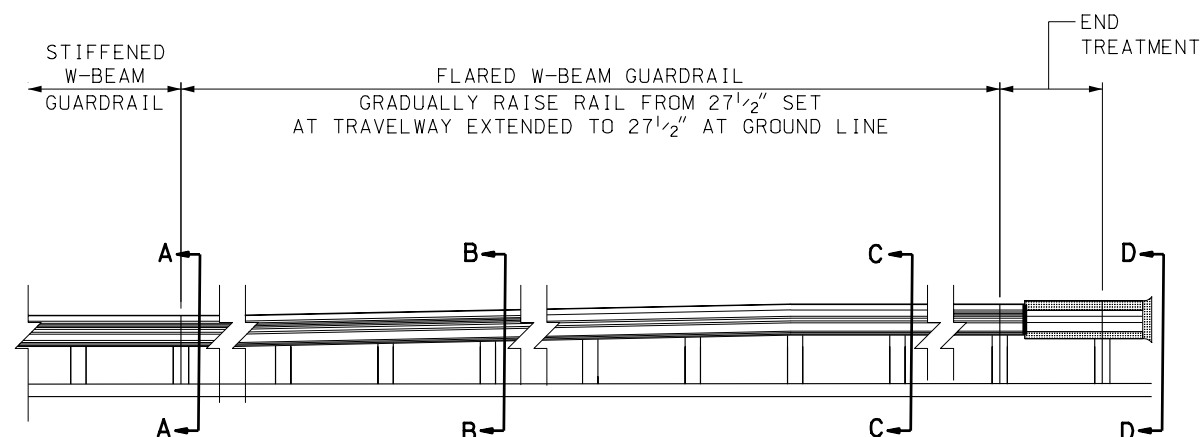
REVISIONS
1 11/30/06 G.S NEW DRAWING.

REMARKS

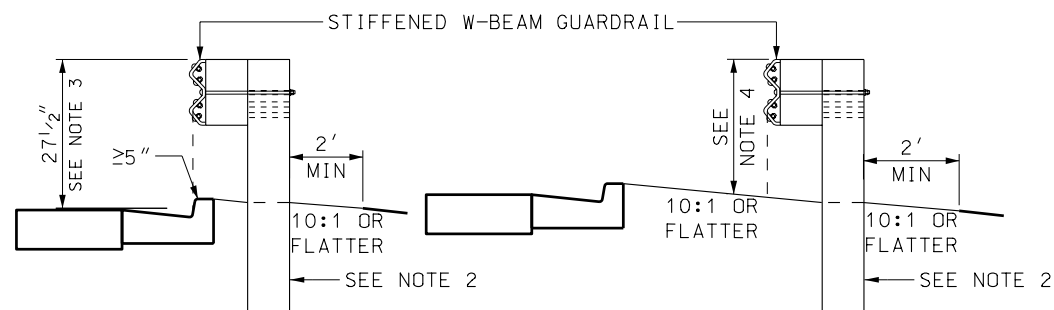
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PLAN
SEE NOTE 1

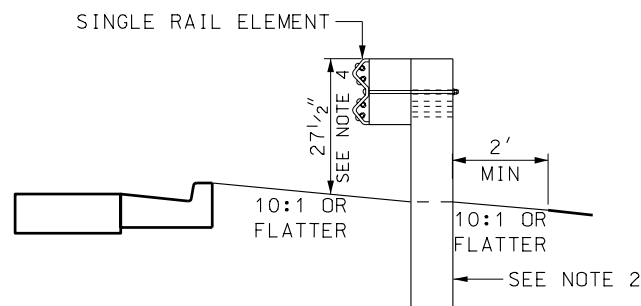


ELEVATION
SEE NOTE 1

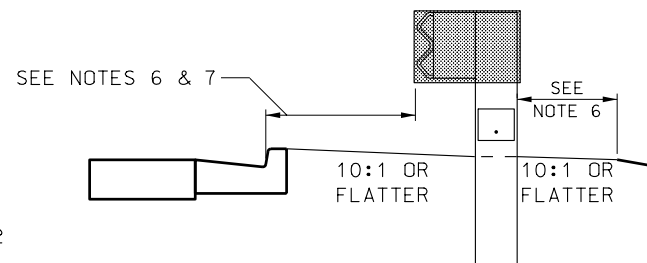


SECTION A-A

SECTION B-B



SECTION C-C

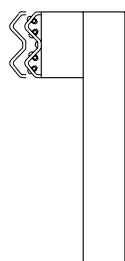


SECTION D-D

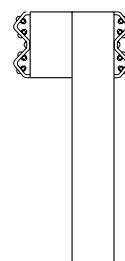
TYPE B1 CURB AND GUTTER SHOWN AS EXAMPLE
APPLIES TO ALL CURBS AND/OR CURB AND GUTTER TYPES

SEE NOTE 1

STIFFENING METHODS



NESTED W-BEAM



BACK SIDE RAIL
ATTACHMENT

NOTES:

1. USE STIFFENED W-BEAM GUARDRAIL WHEN DESIGN SPEED IS 50 MPH OR GREATER.
2. DRIVE GUARDRAIL POST TO THE DEPTH REQUIRED TO ATTACH BLOCK AND RAIL AT THE TOP HOLE OF THE POST FOR COMPLETE GUARDRAIL RUN.
3. SET RAIL HEIGHT AT FACE OF CURB FROM TRAVELWAY SURFACE EXTENDED, WHEN RAIL IS AT FACE OF CURB.
4. GRADUALLY RAISE RAIL ELEMENT OVER THE LENGTH OF FLARED BARRIER TO ATTACH END TREATMENT AT REQUIRED HEIGHT.
5. ADDITIONAL STIFFENING OF W-BEAM GUARDRAIL TRANSITION, BA 4B, NOT REQUIRED WHEN INSTALLED WITH CURB AND CURB AND GUTTER.
6. CONSTRUCT PAD AS PER APPLICABLE CC STD DWG.
7. OFFSET END TREATMENT AS PER APPLICABLE CC STD DWG.
A. TYPE "G": PLACE ALONG 25:1 FLARE LINE.
B. TYPE "H": PLACE WITH 4 FOOT OFFSET FROM 25:1 FLARE LINE.

W-BEAM GUARDRAIL & END TREATMENT INSTALLATION WITH CURB & GUTTER 5" OR GREATER

REVISIONS
1 11/30/06 G.S. NEW DRAWING.

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
RECOMMENDED FOR APPROVAL
CHAIRMAN STANDARDS COMMITTEE
APPROVED

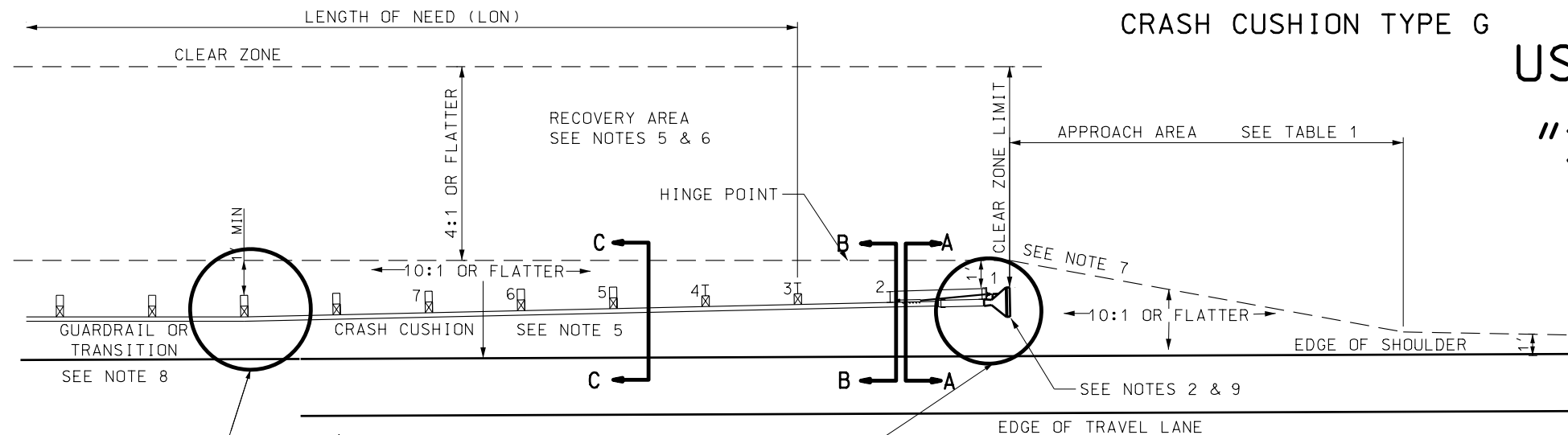
NOV. 30, 2006
DATE
NOV. 30, 2006
DATE
DEPUTY DIRECTOR

W-BEAM GUARDRAIL
WITH CURB
AND GUTTER ≥5"

STANDARD DRAWING TITLE

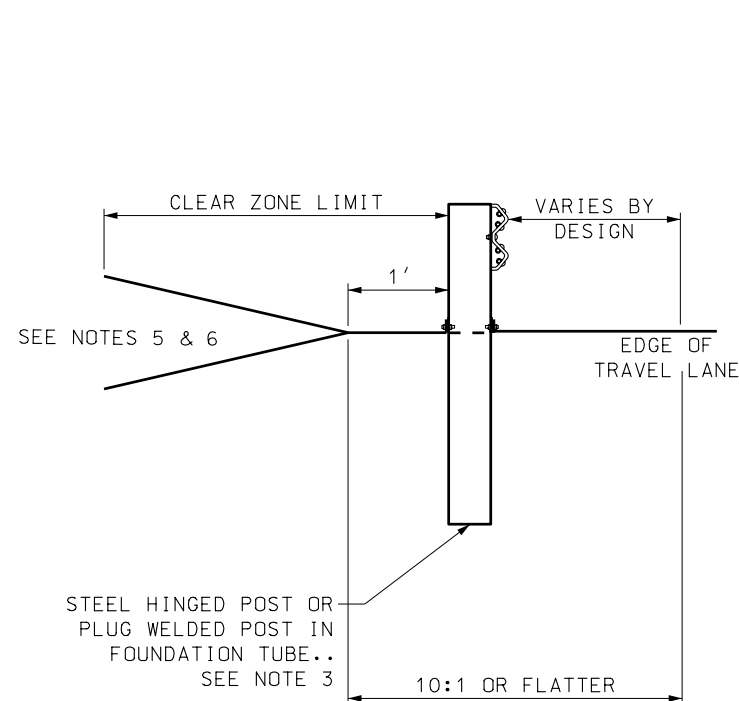
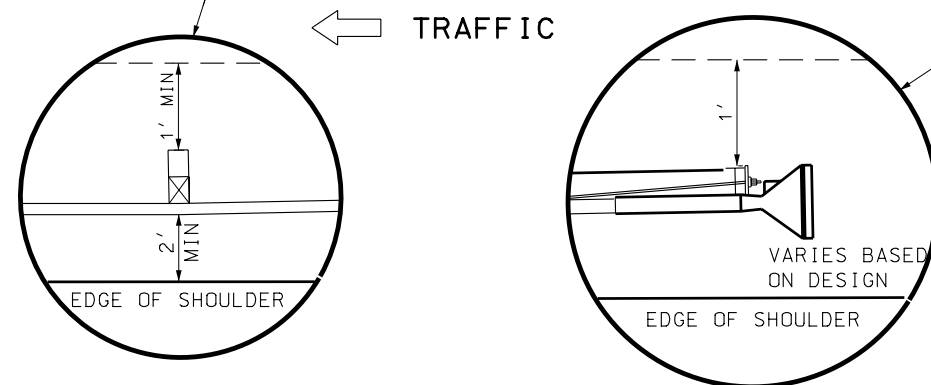
STD DWG
BA 452

18-DEC-2006 DGN File: L:\Standard Drawings\Impervial\2005\Approved\Change8\Approved\CC8B.dgn

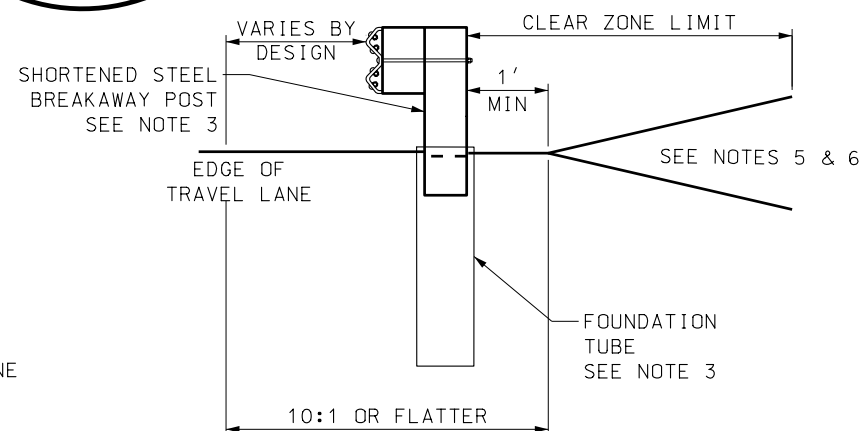


USE THIS DETAIL FOR
"3R" PROJECTS ONLY

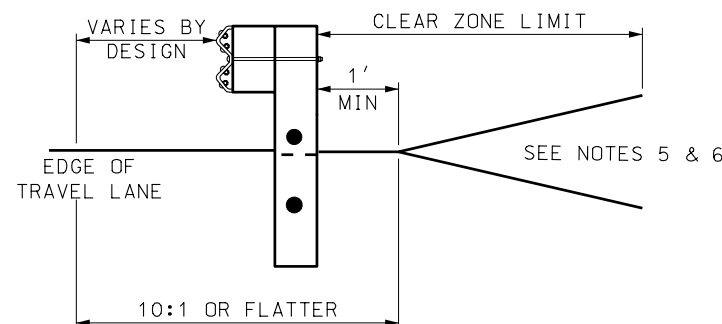
TABLE 1	
SPEED MPH	TAPER
LESS THAN 40	7:1
40 TO 55	10:1
60 TO 75	15:1



TYPICAL SECTION A-A
POST 1
SEE NOTE 3



TYPICAL SECTION B-B
POSTS 2-4



TYPICAL SECTION C-C
POSTS 5-8
SEE NOTE 3

NOTES:

- APPROVED SYSTEMS: ET-2000 AND ET-PLUS MANUFACTURED BY TRINITY INDUSTRIES AND THE SKT-350, MANUFACTURED BY ROAD SYSTEMS INC. REFER TO UDOT'S GUIDELINES FOR CRASH CUSHIONS AND END TREATMENTS FOR SPECIFIC SYSTEM DETAILS.
- SYSTEM OFFSET:
 - INSTALL SYSTEM WITH 2 FOOT OFFSET (25:1 FLARE RATE) WHEN USED WITH A TANGENT BARRIER SYSTEM.
 - INSTALL SYSTEM AT THE SAME FLARE RATE AS THE BARRIER INSTALLATION SYSTEM IS BEING ATTACHED TO.
- POST OPTIONS: REFER TO UDOT'S GUIDELINES FOR CRASH CUSHION FOR APPROVED POST OPTIONS.
 - POST 1
 - ET SERIES-HINGE BREAKAWAY POST (HBA)
 - SKT-350 PLUG WELDED POST INSIDE FOUNDATION TUBE.
- RAIL ELEMENTS
 - USE 12¹/₂ FOOT RAIL ELEMENTS AS SPECIFIED BY THE SYSTEM MANUFACTURER.
 - DO NOT BOLT RAIL ELEMENT TO POST 1.
 - REFER TO MANUFACTURE SPECIFICATIONS FOR OTHER RAIL TO POST BOLT REQUIREMENTS.
- COMPLETE SLOPE PREPARATIONS PRIOR TO INSTALLING SYSTEM.
 - USE 10:1 OR FLATTER SLOPES IN APPROACH AREAS.
 - CONSTRUCT RECOVER AREA SLOPE AS PER CC 8A WHEN CONDITIONS PERMIT. CONSULT ENGINEER FOR ALLOWABLE SLOPES WHEN SLOPE REQUIREMENTS OF CC 8A CANNOT BE MET.
- CLEAR RECOVERY AND APPROACH AREAS OF ANY FIXED OBJECTS.
 - DO NOT PLACE SIGNS OR POLES IN APPROACH AREA.
 - USE BREAKAWAY SIGNS OR POLES WHEN PLACED IN RECOVERY AREA, AND MAINTAIN A MINIMUM 10 FOOT CLEARANCE TO THE SIDES AND REAR OF THE SYSTEM.
- CONSTRUCT PLATFORM AS REQUIRED EVEN IF THE PLATFORM EXTENDS BEYOND THE CLEAR ZONE REQUIREMENT.
- USE GUARDRAIL TRANSITION, STD DWG BA 4 SERIES, WHEN ATTACHING SYSTEM TO CONCRETE BARRIER OR BRIDGE PARAPET.
- INSTALL REQUIRED MARKINGS AS PER STD DWG CC 1.
- USE THE CURRENT EDITION, ROADSIDE DESIGN GUIDE TO ESTABLISH CLEAR ZONE REQUIREMENT AND LENGTH OF NEED (LON) REQUIREMENTS.

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION

GRADING AND
INSTALLATION DETAILS
FOR "3R" PROJECTS
CRASH CUSHION TYPE G

STD DWG
CC 8B

REVISIONS
1 02/24/05 GS NEW DRAWING.

2 04/28/05 GS REISSUED TO CORRECT OVERSIGHT.

3 11/30/06 GS REVISED TO REFLECT STEEL POST REQUIREMENTS.

NOTE 2 OFFSET REQUIREMENT.

NOV. 30, 2006

DATE

NOV. 30, 2006

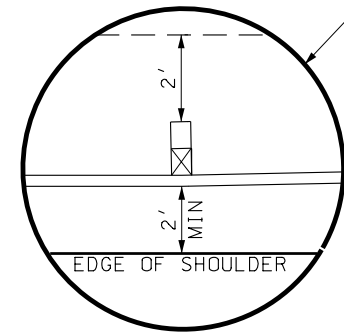
DATE

DEPUTY DIRECTOR

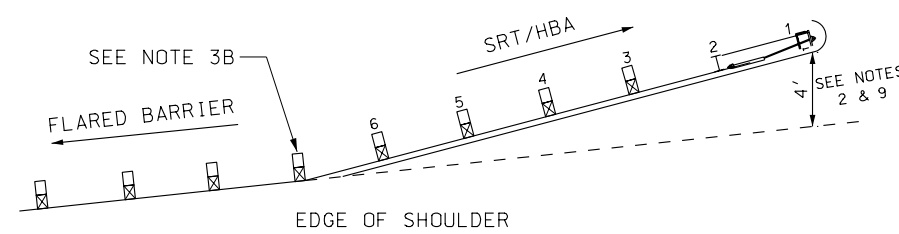
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REMARKS

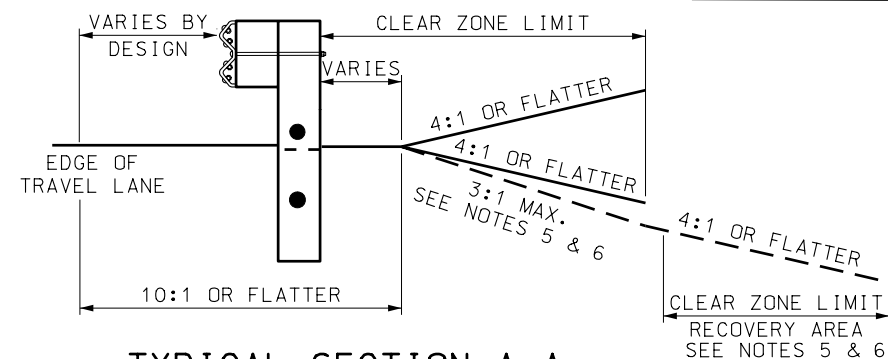
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WOOD/STEEL POST SEE NOTES 2, 3 & 8
SEE NOTES 2, 3 & 8

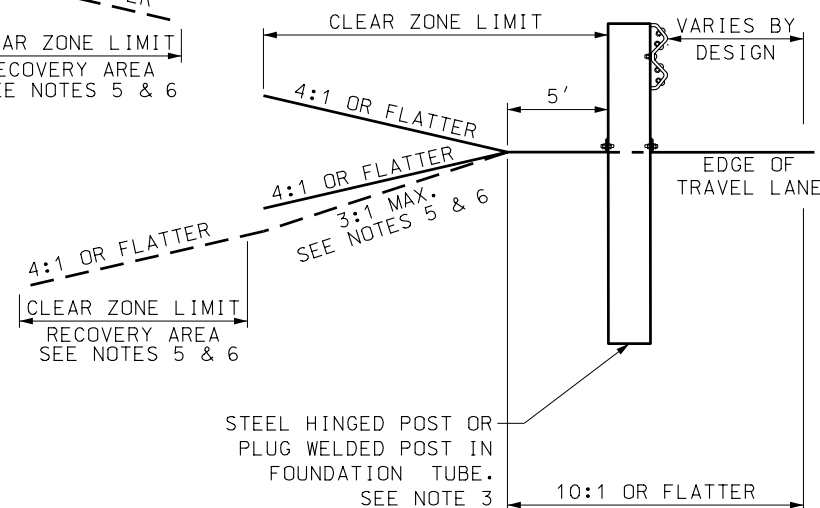


SEE NOTE 2 C



TYPICAL SECTION A-A
POSTS 3-8

TABLE 1	
SPEED MPH	TAPER
LESS THAN 40	7:1
40 TO 55	10:1
60 TO 75	15:1



POSTS 1-2
SEE NOTE 3

1. APPROVED SYSTEMS: FLEAT 350, MANUFACTURED BY ROAD SYSTEMS, INC. AND SRT/HBA MANUFACTURED BY TRINITY INDUSTRIES REFER TO UDOT'S GUIDELINES FOR CRASH CUSHIONS AND END TREATMENTS FOR SPECIFIC SYSTEM DETAILS.
2. SYSTEM OFFSET:
 - A. INSTALL SYSTEM WITH A 4 FOOT OFFSET WHEN USED WITH A TANGENT BARRIER SYSTEM.
 - B. FLEAT-350: INSTALL AT THE SAME FLARE RATE AS THE BARRIER INSTALLATION.
 - C. SRT/HBA: INSTALL SYSTEM WITH A 4 FOOT OFFSET, FROM THE FLARED BARRIER EXTENDED.
3. POST OPTIONS: REFER TO UDOT'S GUIDELINES FOR CRASH CUSHIONS FOR APPROVED POST OPTIONS.
 - A. POSTS 1 AND 2
 - 1) FLEAT-350 PLUG WELDED POSTS SET INSIDE 6' FOUNDATION TUBES.
 - 2) SRT/HBA HINGE BREAKAWAY POSTS.
 - B. SRT/HBA: THE LAST POST OF THE GUARDRAIL INSTALLATION OR THE GUARDRAIL TRANSITION ELEMENT (POST #11) WILL BE SUBSTITUTED WITH A CRT POST AS PER MANUFACTURER'S REQUIREMENTS.
4. USE 12¹/₂ FOOT RAIL SECTIONS (3 EACH SECTIONS), SLOTTED AS PER MANUFACTURER'S REQUIREMENTS.
5. COMPLETE SLOPE PREPARATION PRIOR TO INSTALLING SYSTEM.
 - A. USE 10:1 OR FLATTER SLOPES IN APPROACH AREA.
 - B. USE 4:1 OR FLATTER FORESLOPE OR BACKSLOPE IN THE RECOVERY AREA.
 - 1) IF A 4:1 FORESLOPE IN RECOVERY AREA IS IMPRACTICAL USE A MAXIMUM 3:1 FORESLOPE. ESTABLISH A RECOVERY AREA AT THE TOE OF THE 3:1 FORESLOPE OF 4:1 OR FLATTER.
 - C. USE A 4:1 BACKSLOPE TO THE CLEAR ZONE LIMIT IN THE RECOVERY AREA IF A 4:1 CANNOT BE ESTABLISHED A 3:1 IS PERMITTED.
6. CLEAR RECOVERY AND APPROACH AREAS OF ANY FIXED OBJECTS.
 - A. DO NOT PLACE SIGNS OR POLES IN APPROACH AREA.
 - B. USE BREAKAWAY SIGNS OR POLES WHEN PLACED IN RECOVERY AREA, AND MAINTAIN A MINIMUM 10 FOOT CLEARANCE TO THE SIDES AND REAR OF SYSTEM.
7. CONSTRUCT PLATFORM AS REQUIRED EVEN IF THE PLATFORM EXTENDS BEYOND THE CLEAR ZONE REQUIREMENTS.
8. USE GUARDRAIL TRANSITION, STD DWG BA 4 SERIES, WHEN ATTACHING THE SYSTEM TO CONCRETE BARRIER OR BRIDGE PARAPET.
 - A. SRT/HBA: REPLACE THE LAST POST OF THE TRANSITION WITH A CRT POST. SEE NOTE 3.
9. INSTALL REQUIRED MARKINGS AS PER STD DWG CC 1.
10. USE THE CURRENT ROADSIDE DESIGN GUIDE TO ESTABLISH CLEAR ZONE REQUIREMENT AND LENGTH OF NEED (LON) REQUIREMENTS.

REVISIONS					
1	01/22/05	GS	MODIFIED RECOVERY AREA REQUIREMENTS, REVISED NOTES AND TABLE 1, ADDED SRT/HBA FLARED BARRIER DETAIL.		
2	04/28/05	GS	REISSUED TO CORRECT OVERSIGHT.		
3	11/30/06	GS	REVISED TO REFLECT STEEL POST REQUIREMENTS.		
ID.	DATE	APPR.	REMARKS		

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SCALE: 1"=40'-0"

GRADING AND INSTALLATION DETAILS

THE

TD DWG

CC 9A